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DRAFT

August 1992

Roseburg District Resource Management Plan and Environmental Impact Statement

Volume I

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interest of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

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BUREAU OF LAND MANAGEMENT
Roseburg District Office
777 NW Garden Valley Boulevard
Roseburg, Oregon 97470

IN REPLY REFER TO:

Dear Reader:

You are cordially invited to assist the Bureau of Land Management (BLM) in a planning process that is important to you and your interests.

We ask for your participation in evaluating this draft of the Roseburg District Resource Management Plan/Environmental Impact Statement (Draft RMP/EIS) that has been prepared in conformance with land use planning procedures established by the Federal Land Policy and Management Act of 1976.

The planning area encompassed by this document is BLM's Roseburg District. The planning area includes approximately 419,400 acres of federal land administered by BLM, located in Douglas county.

There are seven management alternatives, each with a different emphasis and each addressing the planning issues in a different way. Public comment played an important role in shaping both the issues and the alternatives which have been analyzed in this Draft RMP/EIS. Before the Preferred Alternative was developed, suggestions received from individuals, interest groups, and other governmental entities were thoroughly considered. These suggestions were utilized to strike a reasonable balance, considering relevant legal mandates, between the desires expressed to emphasize the production of commodity resources; maintain the current flow of resources from the public lands; and protect, restore, and enhance natural values.

Through this Draft RMP/EIS the BLM has tentatively established, resource management goals (as expressed by each alternative); resource management objectives and specific management actions which would determine the potential land uses; levels of resource production; areas in which use restrictions would apply; and lands which could be transferred, sold, or exchanged.

The end product of this planning process will be an Approved Resource Management Plan (ARMP) which will integrate the natural resources and their subsequent uses into a balanced, sustainable approach to multiple use management of the Roseburg District for the life of the plan, or approximately the next 10 years. Your participation in guiding the future management of these lands is encouraged. The ARMP will replace and supersede the Dillard, South Umpqua, North Umpqua, and Drain Management Framework Plans, and the Roseburg Timber Management EIS, 1983, for the Douglas and South Umpqua sustained yield units.

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We would appreciate you reviewing this document and providing us with your written comments by December 21, 1992. Comments are most useful when they address one or more of the following: 1) errors in the analysis that has been performed, 2) new information that would have a bearing on the analysis, 3) misinformation that may have been utilized and could affect the outcome of the analysis, 4) requests for clarification, and 5) support of an existing alternative or definition of a substantive new alternative within the range of alternatives considered (an alternative that would provide a different mix of allocations than any existing alternative). To assist you in this, you are invited to contact Phil Hall, Planning Team Leader, at any time during the comment period.

We welcome any information that will help us to best develop a management plan and analyze its anticipated effects. For example, although we have identified and quantified primary economic effects of the alternatives, we recognize that there are other effects on social values that are important, even though they are very difficult to describe or measure. Your comments may help us to better address these and other effects in the proposed RMP/Final EIS.

The map showing major plant groups and old-growth was not available when this document went to print. As soon as it is available, it will be sent to those receiving a copy of this Draft RMP/EIS.

BLM employees will be available at informal public meetings to be held during the comment period. Public meetings will be held in the Roseburg District Office and at other locations in Douglas county. The dates, times, and locations will be announced in a separate mailer as well as in the local news media.

If you are interested in an overview of all six BLM's western Oregon Draft Resource Management Plans, our Oregon State Office has published an executive summary of these plans. A copy may be obtained in our office or by writing to P.O. Box 2965, Portland Oregon 97208.

Thank you for your interest in the multiple use management of BLM-administered lands.

Sincerely,

James A. Moorhouse
District Manager

Enclosure: (as stated)

U.S. Department of the Interior
Bureau of Land Management

Draft
Roseburg District
Resource Management Plan

Environmental Impact Statement

Prepared by
Roseburg District Office

D. Dean Bibles
State Director, Oreogn/Washington

James A. Moorhouse
District Manager, Roseburg District

Draft (X) Final ( ) RMP/EIS
Department of the Interior
Bureau of Land Management

1. Type of Action: Administrative (X) Legislative ( ).

2. Abstract: This draft resource management plan/environmental impact statement addresses resource management on 419,400 acres of federal land administered by the Bureau of Land Management in its Roseburg District. Seven alternatives including no action (no change in the existing plan) are analyzed. These alternatives range from management of timber and other resources vital to the economy, to management and enhancement of values such as biological diversity, spotted owl habitat, old-growth forests, recreation opportunities, and scenic resources. The preferred alternative would provide a planned annual timber sale level of 16.3 mmcf (105 mmbf), while meeting established water quality criteria in all watersheds. Also, 91,700 acres of old-growth forest would be retained at the end of the first decade; three additional areas of crictical environmental concern would be designated; and no river segments would be found suitable for designation under the Wild and Scenic Rivers Act.

3. The comment period will end on December 21, 1992.

4. For further information contact:

Phil Hall
RMP/EIS Team Leader
Bureau of Land Management
Roseburg District Office
777 NW Garden Valley Blvd.
Roseburg, Oregon 97470
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User's Guide

User's Guide

The Summary presents a synopsis of the draft RMP/EIS. It summarizes all alternatives but presents more detail for the preferred alternative. It summarizes the land use allocations for all issues. It also includes a summary of the environmental consequences and brief descriptions of monitoring, consistency with other governmental entities, and public involvement.

Chapter 1 is the Introduction to the draft RMP/EIS. This chapter includes a description of the planning area and the purpose and need for preparing the RMP/EIS. It also includes a discussion of the RMP's relationship to BLM policies, programs, and other plans and describes the planning process and planning criteria. Finally, it identifies the issues or concerns addressed in the RMP/EIS process.

Chapter 2 (Description of the Alternatives including the Preferred Alternative) has two major sections; Management Direction Common to All Alternatives and Management Direction by Alternative. The first section is particularly important to understanding how lands would be managed under every plan alternative. This chapter describes seven different alternatives which respond to the 11 issues identified in Chapter 1. The alternatives provide a mix of uses and actions which could resolve the issues. This chapter includes a tabular summary of the alternatives so they can be compared. It also includes maps displaying the major land use allocations for each alternative, except No Action. These maps are located in a map packet included with this document.

Chapter 3 (Affected Environment) describes the environment that could be affected or changed by implementing any of the alternatives. This chapter includes a description of the environmental factors (water resources, vegetation, wildlife habitat, visual resources, etc.) and major uses (recreation, timber, etc.) related to the issues.

Chapter 4 (Environmental Consequences) describes potential impacts and changes to the affected environment if any of the alternatives were implemented. It includes an overview of each alternative's relationship to plans and programs of other government agencies.

Chapter 5 describes agencies and organizations BLM has worked with during the preparation of the draft RMP/EIS. It discusses relevant relationships with other agencies and summarizes public involvement.

DRMP/EIS Summary

Introduction

The Roseburg Resource Management Plan (RMP) will establish guidelines for the management of BLM-administered land in the Roseburg District for approximately ten years. It will supersede and replace four management framework plans covering the same area, completed in 1983. The Draft RMP/EIS has been prepared in accordance with the BLM planning regulations issued under authority of the Federal Land Policy and Management Act and written in accordance with Council on Environmental Quality regulations issued under authority of the National Environmental Policy Act.

BLM-administered lands in the planning area consist of 391,578 acres of O&C lands, 13,924 acres of CBWR lands, and 18,426 acres of public domain lands plus 1,717 acres of split estate (federal minerals).

Alternatives

Seven alternatives have been developed to provide a range of responses to major issues identified earlier in the planning process. These issues are: timber production practices; old-growth forests; habitat diversity; threatened and endangered species habitat; special areas; visual resources; stream, riparian and water quality protection; recreation resources, including wild and scenic rivers; land tenure; and rural interface areas. Of particular interest is whether or not to harvest the remaining old-growth forests and the related effects on regional and local economies, biological diversity and the northern spotted owl, a federally listed threatened species.

Each alternative offers a possible broad course of action that, if selected, would provide guidelines for future, more specific decisions. Site-specific management for various resources, annual timber sale plans, and issuance of rights-of-way, leases or permits will follow the guidelines identified in the RMP.

The land use or resource allocations of the alternatives are summarized in Table S-1, found at the end of the summary. Analysis of effects of each alternative except No Action has been facilitated by development of 10-year representative timber management scenarios. These reflect possible timber harvest units, road locations, and timber management practices during the life of the RMP. These scenarios include different levels of forest management practices (also shown in Table S-1). Anticipated environmental consequences of the alternatives are summarized in Table S-2, also located at the end of the summary.

A summary of the No Action alternative, alternatives A, B, C, D, E, and the Preferred Alternative follows. Maps of the alternatives and the preferred alternative strategies for western Oregon are in the enclosed map packet. (If you received only this summary, rather than the full Draft RMP/EIS, only the preferred alternative maps are enclosed.)

No Action - This alternative would entail no change from the management direction established in BLM's current management framework plans (except where Congress has since enacted legislation prescribing different management direction for specific geographic areas or transferring specific lands to the administration or ownership of other parties).

This alternative would emphasize timber production and other economically important values to contribute to community stability, consistent with the variety of other land uses. A system of blocks of old-growth and mature forest would be retained to contribute to ecological functions important to forest productivity. Restrictions of disturbance of fragile sites and riparian zones would mitigate adverse impacts on soil productivity and water quality. Lands would be allocated for the specific purpose of protecting unique natural values and special status species, including endangered species. Mitigation measures would be used to moderate impacts on fisheries, wildlife, cultural resources, and other non-timber values.

Alternative A - This alternative would emphasize a high production of timber and other economically important values on all lands, and contribute to community stability. It would produce the highest sustained yield of timber on all suitable forest lands legally available for harvest. It would also manage threatened and endangered species habitat and habitats of species proposed for such status as legally required. In addition, it would protect habitats of other species with high potential for listing if known only to exist on BLM-administered lands. One of nine existing Special Areas would be retained. To meet legal requirements for protection of wetlands and water quality, as well as protecting anadromous fish habitat and other relevant values, riparian zones would be managed according to requirements of the Oregon Forest Practices Act and the Federal Water Pollution Control Act. Recreation management emphasis would be on existing recreation sites (including the North Umpqua Wild and Scenic Corridor) and trails of high use and dispersed motorized recreation uses. Land tenure adjustments which enhance BLM long-term sustained yield timber harvest opportunities would be emphasized. No special timber management actions or mitigating measures would be provided in rural interface areas.

Alternative B - This alternative would emphasize timber production and other economically important values to contribute to community stability, consistent with the variety of other land uses, on Oregon and California Railroad (O&C) lands and Coos Bay Wagon Road (CBWR) lands. Public domain lands having greater importance for non-timber values and uses would be managed primarily for the maintenance of the non-timber values and uses. A system of blocks of old-growth and mature forest would be retained to contribute to ecological functions important to timber productivity. Habitat of threatened and endangered species and species proposed for such status would be protected. Other special status species would be protected to the extent they would not interfere with high timber production. Timber harvest would not be planned in riparian zones of important waters (third order and larger streams and wetlands). Seven of nine existing Special Areas would be retained, one existing Special Area would be expanded and one new one designated. No rivers (other than the already designated North Umpqua River) would be found suitable for designation as Wild and Scenic. Scenic resources would be managed in selected special status and high use areas. Recreation management would provide for a wide range of developed and dispersed recreation uses.

Land tenure adjustments of O&C and CBWR lands would be made primarily to acquire lands which would enhance timber management opportunities. Exchanges of public domain lands would be made to benefit one or more of the resources managed. Alternative forest management practices would be applied in rural interface areas which include lands zoned for occupancy of one to five-acre lots within 1/4-mile of BLM-managed lands.

Alternative C - This alternative would provide timber production to contribute to community stability consistent with the variety of other land uses. It would emphasize retention and improvement of biological diversity, retaining a system that maintains some old-growth and mature forest, stressing connectivity and focusing on areas where special status plant and animal species cluster. Habitats of threatened and endangered species, species proposed for such status, and species with a high potential for federal listing as threatened or endangered would be protected. Other species of related concern would be protected primarily through the emphasis on biological diversity. Timber harvest would not be planned in or immediately adjacent to riparian zones of important waters. Eight of nine existing Special Areas would be retained, four existing Special Areas would be expanded and two new ones would be designated. No rivers in addition to the North Umpqua would be recommended suitable for designation as Wild and Scenic. Scenic resources would be managed in selected special status and high use areas. Recreation management would provide for a wide range of recreation opportunities, emphasizing dispersed use. Special forest management practices would be applied where apropriate in rural interface areas which include lands within 1/4-mile of areas zoned by Douglas County for one to five-acre residential lots. Land tenure adjustments would be made to benefit a variety of uses and values.

Alternative D - This alternative would emphasize management and enhancement of values such as diversity of wildlife habitat, dispersed non-motorized recreation opportunities, and scenic resources, consistent with a variety of other land uses including some timber production. Spotted owl habitat would be protected in accordance with the Conservation Strategy for the Northern Spotted Owl (Thomas et al. 1990). Species with a high potential for federal listing as threatened or endangered and other special status species would be protected. Timber harvest would not be planned in and adjacent to riparian zones of important waters or their immediate tributaries. Six of nine existing Special Areas would be retained, four existing Special Areas would be expanded, and three new ones designated. No additional rivers would be found suitable for designation as Wild and Scenic. All identified scenic resources would be managed as inventoried. Recreation management would emphasize dispersed non-motorized opportunities. Special timber harvest and forest management practices would be applied in rural interface areas which include lands within 1/4-mile of areas zoned for one to five-acre residential lots. Land tenure adjustments would be made to benefit a variety of uses and values.

Alternative E - This alternative would emphasize protection of older forests and management and enhancement of values such as dispersed non-motorized recreation opportunities and scenic resources. A sustained yield of timber would be produced consistent with the emphasis on these other values. All old-growth forest stands would be retained. Species with a high potential for Federal listing as threatened or endangered and other special status species would be protected. Timber harvest would not be planned in, or adjacent to, riparian zones. Six of nine existing Special Areas would be retained, four existing Special Areas would be expanded, and three new ones designated. Two additional rivers would be found suitable for designation as Wild and Scenic, with a recreation classification. All identified scenic resources would be managed and some visual resource protection would be provided for all lands. Recreation management would emphasize dispersed non-motorized opportunities. Special timber harvest and forest management practices would be applied in rural interface areas. Land tenure adjustments would be made to emphasize enhancement of nontimber uses and values. Alternative forest management and timber harvest practices would be applied in rural interface areas which include lands zoned for occupancy of one to five-acre lots within 1/2-mile of BLM-managed lands.

Preferred Alternative

The preferred alternative is the BLM's suggested planning solution. It will be reconsidered after review of public comments on this draft RMP/EIS. The preferred alternative was formulated after initial analysis of the effects of the other alternatives. In formulating it, the district's managers considered public comments received in response to the district's February 1991 Summary of the Analysis of the Management Situation and other comments received during the planning process.

BLM managers believe the preferred alternative best balances public demands and the capabilities and limitations of the resources, within the constraints of a variety of legal mandates. It represents a sustainable balance between protection of natural resources and production of economic outputs.

Planning Issues and Major Concerns Addressed by the Preferred Alternative

General

Inherent in all management practices is a goal of maintaining long-term site productivity of soils. This goal would be accomplished by use of best management practices and minimizing disturbance of fragile areas.

All BLM prescribed fire activities which could affect air quality would be conducted in accordance with the Oregon State Implementation Plan, administered by the Department of Environmental Quality, and the Oregon Smoke Management Plan, administered by the Department of Forestry.

Special management would be provided for the Pacific yew, the bark of which is the only currently approved (by the Food and Drug Administration) source of taxol, a promising agent for treatment of a variety of cancers. The strategy for management and collection of Pacific yew bark on federal lands is the subject of a separate environmental impact statement (EIS) being prepared by the U.S. Forest Service, with BLM as a cooperating agency. BLM actions covered by this RMP will be consistent with the strategy under development. This strategy will include how to assure a sustainable yew supply with full consideration of ecosystem relationships of the yew. Included will be regeneration of yew and possible extraction of taxol without harvesting individual trees.

The BLM would aid and support the Oregon Economic Development Department's efforts to help isolated, small communities develop and implement alternative economic strategies as a partial substitute for their faltering timber based economies. Aid and support would consist mostly of coordination and prioritization of BLM recreation management and development activities which are mutually perceived by the BLM and the involved communities as benefiting the identified economic strategies.

Water Quality and Riparian Zones

To assure protection of water and water-dependent resources, the BLM would continue nonpoint source management in cooperation with the U.S. Environmental Protection Agency and the Oregon Department of Environmental Quality. Management activities would be consistent with Oregon's adopted statewide water quality management plan for forest practices, and comply with Oregon's water quality standards and guidelines. Best management practices would be selected to protect the identified beneficial uses of the water. They would be based on site-specific conditions, feasibility, and the water quality standards for waters potentially affected.

Since BLM-administered lands are a minority in many watersheds, impact analysis acknowledges that BLM can only partly influence water quality. Factored into BLM timber sale scheduling decisions would be an assessment of compliance with the anti-degradation policy of Oregon's water quality standards. This assessment would recognize the influence of actions by other parties.

In watersheds providing surface water to public water systems serving municipalities, the goal of management would be to provide treatable water at the point of intake to the system.

Riparian management areas (RMA) would be established to provide stewardship of riparian zones along perennial streams and other streams that carry fish and to protect natural functions. Within these RMAs, no timber harvest would be planned as part of the sustained yield timber management program but some harvest activities could occur to achieve resource management objectives. These activities could include road construction and yarding corridors to facilitate timber harvest outside the RMA. RMA widths would be determined by on-the-ground riparian vegetation and stream characteristics. Average widths on each side of streams and other waters are expected to be as follows: 1st and 2nd order perennial streams 75 feet; 3rd order streams 105 feet (150 feet for any 1st through 3rd order stream that carries fish); 4th order 150 feet; 5th order 210 feet; 6th order 240 feet; lakes, ponds and other waters 150 feet. These widths for streams approximate one-and-a-half times the average riparian zone width of such streams as measured in two western Oregon BLM districts.

Old-Growth and Mature Forest

Old-growth conifer stands inventoried by the BLM contain dominant trees at least 200 years old, generally a multilayered canopy of various tree species, and standing and fallen dead trees. Old-growth forest forest habitat projections for the preferred alternative are shown in Figure S-1.

Forest lands not subject to planned timber harvest, due to allocation for protection of special values or concern about sustainability of timber production, total 63,000 acres. These lands currently include 14,300 acres of mature and 21,400 acres of old-growth stands.

An additional 121,900 acres would be managed to maintain and strengthen a system of old-growth emphasis areas, to help maintain a diversity of species in western Oregon. These 121,900 acres include 24,400 acres of mature stands and 37,100 acres of old-growth stands. These areas would incorporate some of the lands noted in the preceding paragraph. Regeneration harvest of timber in these areas would not occur until all younger stands on BLM-administered lands in such an area are at least 80 years old and research has shown that such harvest can be designed to retain or quickly reestablish old-growth characteristics. No such regeneration harvest would occur in the first decade.

The forests in these areas younger than 110 years old would be managed to control their density in order to accelerate creation of old-growth conditions. These areas would ultimately be subject to regeneration timber harvest on a cycle of some 300 years, with retention of biological legacies including six to ten green trees per acre in openings not to exceed five acres.

The old-growth emphasis areas would be linked by connectivity areas managed on a regeneration harvest cycle of 150 years, with retention of biological legacies including 12 to 16 green trees per acre, Together these areas would contribute to regional biological diversity by linking to such areas in other districts and protected national forest lands. This would provide subregional and regional connectivity, and would contribute to the recovery of the northern spotted owl. These stands would also be managed to control their density, for the purpose of accelerating development of old-growth characteristics.

As of 1990, 114,700 acres (27 percent) of the BLM-administered forest land in the planning area have old-growth stands. Preferred alternative management would retain 91,700 acres of old-growth forest at the end of the expected 10-year life of the RMP, and provide 99,500 acres of old-growth if the plan were continued for 100 years. This would result in some long-term increase in biological diversity.

Timber

A total of 371,207 acres of commercial forest lands (GIS acres from the TPCC theme) were identified as suitable for timber production. In contrast, in the inventory of the late 1970s, 371,405 acres of High Intensity Management (GLO acres from the 1977 TPCC inventory) were identified as suitable for this purpose. These lands are considered capable of being reforested within five years after harvest and of being managed without irreversible resource damage. Approximately 332,600 acres of these lands would be managed for timber production, among other objectives.

The allocation of lands for timber production is shown graphically in Figure S-2. Some 144,300 suitable acres would be in the general forest management areas. This would include some lands managed under special restrictions to protect or enhance other resource values such as visual resources. Timber production under more extensive restrictions would also take place in connectivity areas and old-growth emphasis areas. See Table S-2 for comparison with other alternatives. The annual allowable timber sale quantity (ASQ) would be 16.3 million cubic feet (105 million board feet Scribner short log for the first decade). This is 57 percent below the current ASQ and 54 percent below the average harvested in the 1984-1988 period.

Lands in general forest management areas not managed under special restrictions would be managed on a regeneration harvest cycle of 90 to 110 years (CMAI). Biological legacies, including an six to eight green trees per acre, would be retained to assure forest health and sustainability of timber production. Some aspects of timber management in old-growth emphasis areas and connectivity areas are described in the previous discussion of Old-Growth and Mature Forest. Some timber would be harvested during density management on the old-growth emphasis areas and connectivity areas. Commercial thinning would be applied in timber management emphasis areas where practicable and where research indicates there would be gains in timber production.

New timber harvest roads would be kept to the minimum necessary for management. Two-hundred and fifteen miles of new roads are expected to support timber sales sold during the life of the RMP. This would expand the existing BLM timber management road network by about eight percent.

Four types of site preparation treatment would be used to prepare newly harvested and inadequately reforested areas for planting of trees: prescribed burning, herbicide application, and mechanical and manual techniques. Selection of treatments for site preparation, as well as for later management of vegetation suppressing conifer seedlings, would use an integrated vegetation management approach, emphasizing techniques proven most effective at assuring seedling survival and growth. This is in conformance with BLM's 1992 Record of Decision, Western Oregon Program - Management of Competing Vegetation. Prevention of conditions that cause or favor the establishment of damaging levels of competing or unwanted vegetation is the preferred strategy. Although broadcast burning would be the primary site preparation method, it would be avoided on highly sensitive soils. Burning would be conducted in accordance with Oregon Smoke Management Plan rules and directives administered by the Oregon Department of Forestry, so that air quality would be maintained.

Harvested areas would be planted with indigenous commercial conifer tree species to promptly achieve adequate reforestation following regeneration timber harvest, This generally would occur within a year after completion of harvesting. Genetically selected seedlings, from a broad selection of parent trees to maintain genetic diversity, would be used to the extent available.

Pre-commercial thinning would be applied in managed stands to meet both timber management and density management objectives. Fertilization would be applied to stands pre-commercially or commercially thinned, stands partially harvested for density management, and other stands where plantation spacing has achieved desired results. These intensive management practices plus planned conversion of lands now growing brush or hardwoods to predominately conifer stands, would contribute 0.34 MMCF (two percent) of the preferred alternative (ASQ). By comparison, in the current plans the same set of practices contribute 15 percent of the ASQ. The intensive practices of the past three decades provide an integral contribution to this decade's ASQ level. The change in the significance of intensive practices in this decade's ASQ determination is due to a combination of factors. Included among the interacting factors which cause this change are non-traditional silvicultural regimes in which intensive practices cannot presently be modeled, deferred harvest allocations, and the available inventory age class distribution.

Special Status (including Threatened and Endangered) Species Habitat

BLM management would be designed to protect federal listed or proposed threatened and endangered species. Proposed projects that might affect such species are reviewed with the Fish and Wildlife Service through consultation under the Endangered Species Act. Consistent with policy identified in BLM's nationwide "Fish and Wildlife 2000" plan, habitats would be managed to maintain populations of federal candidate species at a level which would not contribute to the need to list the species. BLM actions would be designed to similarly protect state-listed and Bureau sensitive species. Permitted and management actions would not be expected to lead to federal listing of any species. Table S-3 shows the numbers of plant and animal species in the above-mentioned categories that have been identified as inhabiting BLM-administered lands in the planning area:

To support the Pacific Bald Eagle Recovery Plan, six existing nest sites and 4660 acres of habitat would be protected.

All actions would be consistent with the Columbian White-tailed Deer Recovery Plan. Timber harvest or other vegetation altering activities on all BLM-administered lands (6,161 acres) within the general area of distribution will only occur if determined to be beneficial to Columbian White-tailed deer or until such time that difinitive information is available describing the use level and value of these lands in the context of meeting recovery plan goals.

The northern spotted owl recovery plan was not final when the BLM's preferred alternative was developed. Elements of the Draft Recovery Plan, however, were included in the preferred alternative. Among those were protective management of proposed designated conservation areas (DCA), with almost all of them included in old-growth emphasis areas (OGEA). The old-growth emphasis areas would be managed to accelerate the development of spotted owl habitat where such habitat does not exist. The connectivity areas would be managed to provide spotted owl dispersal and support habitat. In addition, 80 to 100 acres around each site occupied by an owl pair would be protected until the site is vacated and the habitat is no longer considered important to spotted owl recovery. None of these acres would be harvested in the first decade.

Analysis of the effects of this management in a spatial population model indicates that the habitat resulting from this management after ten years would have a carrying capacity of 14 to 42 pairs of spotted owls. After 100 years the habitat would have a carrying capacity of 28 to 70 pairs of owls. The ranges vary according to optimism of assumptions about the relationship between the amount of suitable habitat at a location and pair formation and reproduction. In comparison, current inventories (through 1991) show 207 pairs of owls. The population model, however, indicates that current habitat carrying capacity is only 36 to 53 pairs. This is due to the substantial decline in owl habitat on all ownerships in recent years, which has left many remaining stands inadequate to support successful breeding and packed owls too tightly into many of the remaining areas of adequate habitat. Comparison of the effects of other alternatives is shown in Table S-2.

Other Wildlife (including Fish) Habitat

The old-growth emphasis areas and the connectivity areas linking them would provide biological connectivity corridors for a variety of species. To contribute to biological diversity, nonmerchantable down, dead woody material would be retained on all areas from which timber is harvested. Enough green trees and snags would be identified for retention to contribute to long-term support of cavity nester populations on BLM-administered lands at 70 percent of the optimum woodpecker population level. This compares to a current condition estimate of 54 percent.

Unique habitats such as talus slopes, meadows, and wetlands would be managed to protect their primary habitat values. They would also be buffered 100 to 200 feet from harvest of standing timber. The special habitat buffer would be an area designated and managed for the protection or enhancement of the special habitat.

The habitat of elk and other species would be protected through closure of certain roads to the public to minimize disturbance. To help meet population goals of the Oregon Department of Fish and Wildlife, forage plants would be seeded. This would be done following timber harvest in big game management areas where big game forage is considered deficient, and where seeding would be compatible with other resource objectives.

Consistent with BLM's nationwide "Fish and Wildlife 2000" plan, the fisheries potential of anadromous fish streams would be enhanced. Large woody debris and snags in and adjacent to streams would be retained unless the debris obstructs fish passage or has the potential to degrade a stream channel. In combination with BLM riparian zone protection this management is expected to contribute to an overall long-term (200 year) 46 percent increase in potential production of salmon and steelhead in streams affected by habitat on BLM-administered lands. To the extent of available funding, fish habitat improvement projects would be undertaken to correct factors limiting anadromous fish production. Included would be projects improving 25 miles of existing stream habitat for salmon and steelhead.

Special Areas

Six existing special areas would be retained, four existing special areas would be expanded, and two new special areas would be designated. Total allocation would be 4,111 acres compared to a present allocation of 2,553 acres.

Recreation

Consistent with BLM's nationwide "Recreation 2000" plan, lands would be managed for a wide variety of recreation opportunities. There would be particular emphasis on enhancement of opportunities for picnicking, camping, and trail use.

All 17 existing recreation sites and trails would remain open. Twenty-seven additional sites and trails would be developed if funding is available. The emphasis of facility management and development would be to accommodate the increasing demand for recreation opportunities close to population centers and accessible by road.

Four road segments (both BLM roads and county roads on BLM-administered lands) totaling 89 miles would be designated Back Country Byways, components of the National Scenic Byway System.

As part of management of the use of off-road vehicles, 19,500 acres would be closed either seasonally or year round to vehicle uses. Use for administrative purposes and authorized removal of commercial commodities such as timber would be excepted. Some 2,250 miles would be open and 250 miles open to limited use.

Use for all recreation activities would be expected to increase during the life of the RMP. Expected demand would be met for all activities except for off-road vehicle use.

Additional emphasis would be placed on interpretive and informational signing and maps to support state and local strategies for encouraging tourism.

Wild and Scenic Rivers

No river segments would be recommended as suitable for designation by Congress under the Wild and Scenic Rivers Act. A 17.5 mile segment of Smith River and a 10.7 mile segment of Canton Creek which were found eligible for designation and studied by BLM would be found not suitable for such designation.

Visual Resources

The 25 acres protected by Congressional designation would be managed for preservation of scenic quality. To retain scenic quality, 38,348 acres of other highly sensitive land would be managed so that landscape alterations caused by management would not attract attention. An additional 6,224 acres of visually sensitive lands would be managed so that landscape alterations would not dominate the view, to partially retain scenic quality.

Cultural Resources

Prehistoric and historic sites would continue to be identified and managed for their public and scientific uses.

Land Tenure

Lands adjustments would emphasize exchanges to benefit multiple resource values. As a matter of practice, substantial areas of O&C forest lands allocated as avaliable for timber management would not be exchanged for lands to be managed for single use management purposes. Any exchanges involving O&C lands would be done in close consultation with the O&C counties. Only public domain lands, however, would be exchanged for the specific purpose of supporting recovery of a threatened or endangered species. Lands would be categorized in the following zones: 35,930 acres where lands would be retained in BLM's administration; 374,168 acres where land ownership may be blocked up in exchanges for other lands, transferred to other public agencies or given some form of cooperative management; and 13,830 acres of lands scattered and isolated, with no known unique resource values. BLM-administered lands in the last category would be exchanged for private inholdings in the other zones or could be considered for sale or for transfer to another agency or local government.

Energy and Minerals

Most BLM-administered lands would remain available for mineral leasing of oil and gas or geothermal resources and location of mining claims, but a variety of designations and allocations such as areas of critical environmental concern or closure to off-road vehicles, restrict exploration and development.

These restriction levels represent some increase in restrictions compared to the current plan, primarily due to recreation sites, special areas, and threatened and endangered species.

Rural Interface Areas

VRM Class III management (and other special timber management practices) would be applied on 8,552 acres of BLM-administered lands within 1/4 mile of private lands where county zoning allows for development on one to five acre lots.

Socioeconomic Conditions

BLM timber management programs are expected to support 540 jobs and provide $13 million a year in personal income during the life of the plan. Those jobs are 1020 (65 percent) less than the average supported in the 1984-1988 period. Recreation activities on BLM-administered lands are expected to support 40 jobs, an increase of 10 from 1984-1988.

The net decline in jobs cited above combines with an expected decline in jobs supported by U.S. Forest Service, private and other timber supplies. This would lead to substantial job losses in some communities in the planning area with consequent adverse effects on community stability.

Jobs are also supported by downstream and offshore recreational and commercial fishing for fish supported by BLM habitat. However, fishing opportunities related to BLM management are not expected to change in the next ten years.

Monitoring The RMP

Monitoring and evaluation of the resource management plan would be carried out at appropriate intervals for the following purposes:

- To be sure activities are occurring in conformance with the RMP.
- To determine if activities are producing the expected results.
- To determine if activities are causing the effects identified in the environmental impact statement.

Consistency with State, Local, Tribal and Other Federal Plans

BLM planning regulations require that resource management plans be consistent with officially approved or adopted resource-related plans, and the policies and procedures therein, of the Federal agencies, state and local governments and Indian tribes, so long as the RMPs are also consistent with applicable Federal laws and regulations. The BLM has compared the preferred alternative of the draft RMP with a variety of such plans of other agencies. This alternative appears to be consistent with all such plans, policies and procedures, except the following.

Public Involvement

Public involvement has been an integral part of BLM's resource management planning effort. Activities have included mailers or brochures, public meetings, open houses, field trips, distribution of planning documents and related comment periods, informal contacts, group meetings, written letters, and responses to comments. These efforts began in May 1986.

Subsequent mailers at least once a year requested comments on issue identification, development of planning criteria contained in state director guidance for the process, and BLM's analysis of the management situation which set the baseline for development of the Draft RMP/EIS. Suggestions for formulation of the preferred alternative were also requested.

The draft RMP/EIS has been released for public review and comment until December 21, 1992. After comments are received they will be evaluated. Substantive recommendations may lead to changes in the analysis of environmental consequences or one or more of the RMP alternatives. The proposed RMP/final EIS is expected to be completed for public review next spring. Any protests on that document will be reviewed and addressed by the director of BLM before a record of decision on the RMP is completed.

Table S-1. Major Land Use or Resource Allocations and Actions on BLM-Admtered Lands, by Alternative

	Allocations/Management Actions by Alternative						
	No Action	A	B	C	D	E	Preferred
Timber							
Forest Management Allocations (acres):							
Intensive	331,600	353,300	318,900	0	0	23,900	144,300
Restricted	35,900	0	2,400	270,200	207,200	23,400	188,300
Enhancement of Other Uses or Not Available	34,400	39,400	71,600	125,300	188,400	348,200	63,000
Allowable Sale Quantity (MMCF)	40.5	47.7	44.0	11.2	14.3	3.2	16.3
Allowable Sale Quantity (MMBF)	247	315	291	74	92	18	105
Practices (assumed average annual acres for first decade):							
Regeneration Harvest	57,000	74,000	66,600	32,400	18,900	6,700	32,200
Commercial thinning /density mgmt. harvest	1400/0	1700/0	1600/0	1100/4300	1000	*	1300/5100
Site Preparation							
Prescribed Fire	44,500	30,000	30,000	24,300	10,400	5,000	24,200
Other	4,000	3,700	3,300	1,600	700	300	1,600
Brushfield/Hardwood Conversion	0	600	500	0	300	100	500
Planting/Regular Stock	52,300	54,100	45,200	19,400	3,300	5,400	3,900
Planting/Genetically Selected Stock	15,200	34,700	34,700	19,400	13,300	2,700	34,700
Stand Maintenance/Protection	70,800	49,600	44,600	21,700	9,300	4,500	21,600
Release/Pre-commercial Thinning	40,400	60,500	55,100	43,500	32,400	7,800	52,800
Fertilization	55,600	62,300	57,600	47,300	36,300	8,300	58,200
New road construction (miles/acres)	500/2727	500/2727	450/2455	190/1036	190/1036	35/191	215/1173

Table S-1. Major Land Use or Resource Allocations and Actions on BLM-Admtered Lands, by Alternative (cont.)

	No Action	A	B	C	D	E	Preferred
Special Status Species Including Threatened and Endangered Species Habitat							
Areas where all Category 1 and 2 Federal candidate, State listed and Bureau sensitive species would be protected if present	423,896	62,806	113,325	116,965	419,074	419,074	419,373
Special Areas							
Existing RNA/ACECs retained (#/acres)	4/613	1/170	4/613	4/613	4/613	4/613	4/613
Other Existing ACECs retained (#/acres)	4/1855	0	3/1840	3/1840	1/1840	1/1840	1/1840
New RNA/ACECs designated (#/acres)	0	0	1/793	3/1922	3/1922	3/1922	2/964
Other new ACECs designated (#/acres)	0	0	0	0	1/727	1/727	1/727
Environmental Education Areas (#/acres)	1/85	0	0	0	0	0	0
Total RNA/ACECs (#/acres)	4/613	1/170	5/1406	7/2535	7/2535	7/2535	6/1577
Total other ACECs (#/acres)	4/1855	0	3/1840	3/1840	2/2567	2/2567	2/2567
Visual Resources							
Acres managed VRM Class I	30	25	25	25	0	6,311	25
Acres managed VRM Class II	9,300	15,176	30,194	43,514	86,779	141,887	38,348
Acres managed VRM Class III	13,600	2,005	6,681	7,189	22,855	271,937	6,224
Acres managed VRM Class IV	401,070	402,929	383,235	369,403	310,501	0	375,538

Table S-1. Major Land Use or Resource Allocations and Actions on BLM-Admtered Lands, by Alternative (cont.)

	No Action	A	B	C	D	E	Preferred
Recreation Resources							
Recreation Sites							
Existing (# sites/acres)	11/1135	11/1135	11/1135	11/1135	11/1135	11/1135	11/1135
New (# sites/acres)	7/85	0/0	3/65	7/107	18/285	18/285	18/285
Trails maintained							
Existing (# trails/miles)	6/13.5	6/13.5	6/13.5	6/13.5	6/13.5	6/13.5	6/13.5
New (# trails/miles)	3/4.5	0/0	0/0	4/4.5	7/10	7/10	7/10
Special Recreation Management Areas							
Existing (#/acres)	1/1620	1/1620	1/1620	1/1620	1/1620	1/1620	1/1620
New (#/acres)	1/1540	0/0	0/0	1/1540	1/1540	1/1540	1/1540
Backcountry Byways (#/miles)	4/89	4/89	4/89	4/89	4/89	4/89	4/89
Acres open to ORV use	409,670	409,670	407,234	405,935	405,004	405,004	405,004
Acres limited to ORV use	0	0	0	0	117,935	414,659	414,659
Acres closed to ORV use	10,465	10,465	12,901	14,200	15,131	15,131	15,131
Wild and Scenic Rivers							
River segments found suitable for designation:							
As Recreational (#/miles)	0	0	0	0	0	185	0
As Scenic (#/miles)	0	0	0	0	0	0	0
As Wild (#/miles)	0	0	0	0	0	0	0

Table S-1. Major Land Use or Resource Allocations and Actions on BLM-Admtered Lands, by Alternative (cont.)

	No Action	A	B	C	D	E	Preferred
Energy and Mineral Management							
Acres available for oil and gas and geothermal leasing	421,062	421,062	421,062	421,062	421,062	421,062	421,062
Acres closed to oil, gas and geothermal lease	28	28	28	28	28	28	28
Acres open to mining claim location and operation	416,162	416,960	415,674	414,500	414,323	412,951	414,323
Acres closed to mining location	3,211	2,413	3,699	4,873	5,050	6,422	5,050
Rural Interface Area Management							
Acres where clear cutting, herbicide spraying and prescribed burning excluded	0	0	0	0	8,552	24,052	8,552
Acres managed for VRM Class III objectives	0	0	8,552	8,552	0	0	8,552

*Less than 100 acres.

Table S-2. Summary of Environmental Consequences, Comparison of Alternatives.

	Allocations/Management Actions by Alternative						
	No Action	A	B	C	D	E	Preferred
Air Quality							
Tons of fuel burned annually in prescribed fires, 10 years	60,100	60,100	60,100	80,100	30,300	10,800	80,100
Water Quality							
No. of watersheds probably improving (10 years)	0	0	0	6	9	10	7
No. of watersheds probably declining (10 years)	11	12	10	5	6	3	6
Biological Diversity (After 10 years)							
Mature Forest	79,600	85,700	83,700	79,800	77,700	85,300	66,700
Old-Growth	42,400	34,700	44,600	106,900	94,359	115,600	91,700
Riparian Trend (200 years)							
+,-,0	0	0	+	+	+	+	+
Dominant Woodpecker Population							
Percent of optimum, 10 years	38	35	38	58	54	57	52
Elk Habitat (10 years)							
No. habitat areas improving	0	0	2	1	6	7	6
No. habitat areas unchanged	0	0	0	15	11	14	10
No. habitat areas declining	21	21	19	5	4	0	5
Potential Fish Populations							
200 Years +,-,0	0	0	0	+	+	+	+

Table S-2. Summary of Environmental Consequences, Comparison of Alternatives. (cont.)

	No Action	A	B	C	D	E	Preferred
Threatened and Endangered Species							
Bald eagle existing and potential nest sites protected	6	6	6	6	6	6	6
Columbian White-tailed Deer managed acres	6,017	6,017	6,017	6,017	6,017	6,017	6,017
Peregrine Falcon potential nesting cliffs protected	5	5	5	5	5	5	5
Northern Spotted Owl stuitable habitat acres							
(10 years)	131,800	130,000	139,000	173,000	190,000	208,000	174,000
(100 years)	79,000	32,000	69,000	372,000	179,000	317,000	177,000
Wild and Scenic Rivers (Canton Creek and Smith River study river segments, 10 years)							
Outstandingly remarkable value, Fish; +,-,0	0	0	0	0	0	0	0
Visual Resources, 10 Years; +, −, 0							
Inventoried VRM Class I	0	0	0	0	0	+	0
Inventoried VRM Class II	—	—	—	0	+	+	0
Inventoried VRM Class III	—	—	—	+	+	+	+
Inventoried VRM Class IV	0	0	0	+	+	NA	+
Recreation Use (Capability to meet 10 year demand)							
Off-road travel (ATV and 4x4)	Yes	Yes	Yes	Yes	No	No	No
Non-motorized travel (hiking, bicycling, horseback)	No	No	No	No	Yes	Yes	Yes
Camping	No	No	No	No	Yes	Yes	Yes
Picnicking, study nature, viewing wildlife	No	No	No	No	Yes	Yes	Yes
Boating	No	No	No	Yes	Yes	Yes	Yes
Swiming, general waterplay	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Areas closed to ORV use	10,465	10,465	12,901	14,200	15,131	15,131	15,131

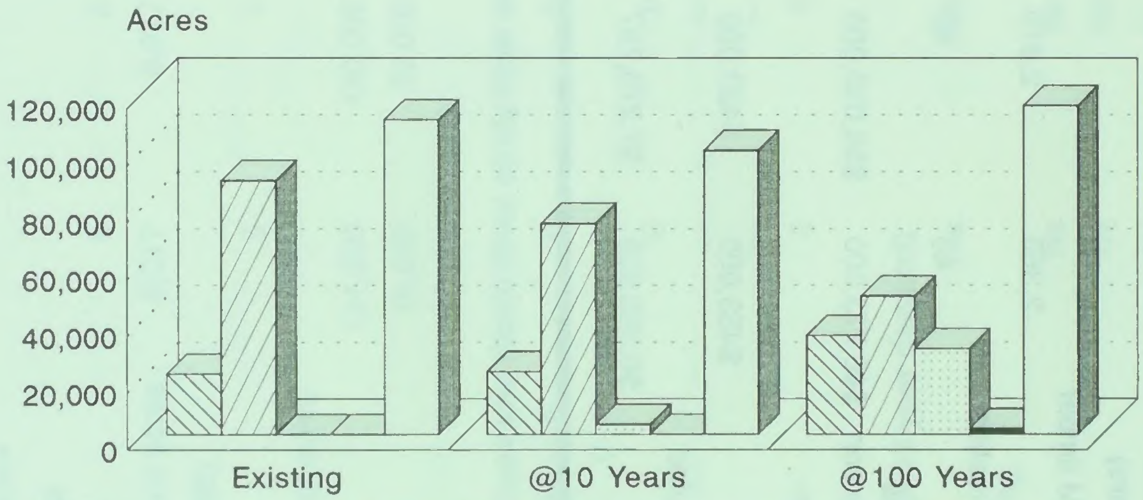
Table S-2. Summary of Environmental Consequences, Comparison of Alternatives. (cont.)

	No Action	A	B	C	D	E	Preferred
Socioeconomic Conditions (10 years)							
Planning area jobs dependent on BLM timber production	2,360	2,810	2,600	790	860	200	1,010
Planning area jobs dependent on recreation on BLM-administered lands	40	40	40	50	50	50	50
Planning area annual personal income dependent on BLM timber production	$46,773,000	$56,035,000	$51,797,000	$14,688,000	$17,052,000	$3,888,000	$19,708,000
Planning area annual personal income dependent on recreation on BLM-administered lands	$453,000	$420,000	$461,000	$552,000	$535,000	$612,000	$582,000
Average annual O&C receipts distributed to Douglas counties	$6,385,928	$7,276,787	$6,872,452	$2,006,185	$2,545,683	$568,702	$2,883,438

Table S-3. Special Status Species Found on BLM-administered Lands.

	Number of Plant Species	Number of Animal Species
Federal Threatened	0	2
Federal Endangered	0	1
Federal Proposed	0	0
Federal Candidate	3	7
State Listed	1	3
Bureau Sensitive	3	1

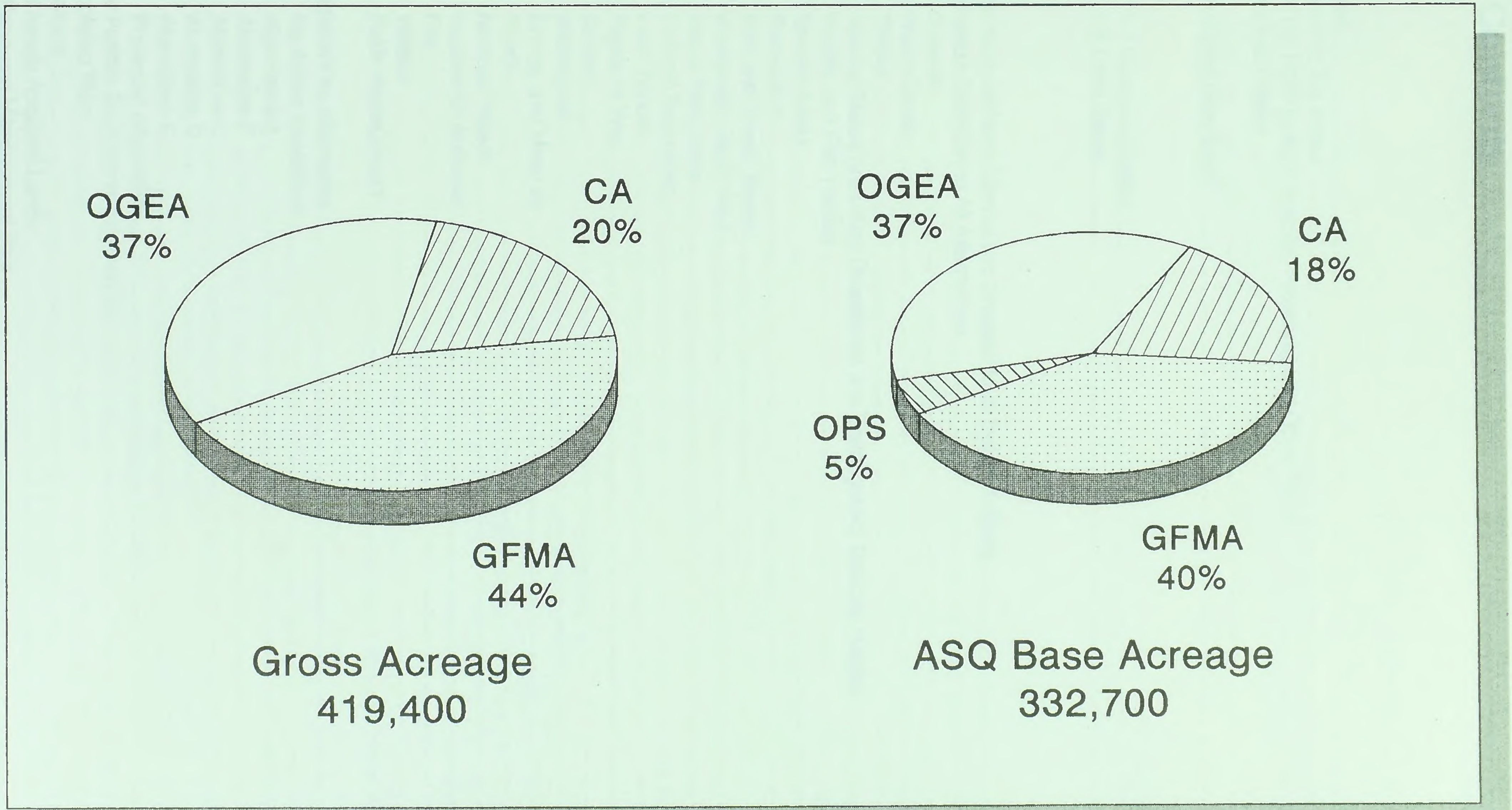
Figure S-1. Old Growth Forest Habitat Projections
Preferred Alternative



		Existing	@10 Years	@100 Years
Out-of-ASQ-Base	▧	21,400	22,200	34,900
In-ASQ-Base	▨	89,400	74,400	48,700
Ingrowth	⬚	0	3,500	30,200
High Retention Entry	■	0	0	2,000
District Total	☐	110,800	100,100	115,800

Out-of-ASQ-Base acreage estimates adjusted for projected wildfire incidents.
Ingrowth projections represent In-ASQ-Base lands only.
High Retention Entry represents regeneration harvest projections in th OGEA's.

Figure S-2. Forest Management Allocations
Preferred Alternative



GFMA: General Forest Management Areas
OGEA: Old-Growth Emphasis Areas
CA: Connectivity Areas
OPS: Owl Pair Sites

Table of Contents

Page

Chapter 1

The Planning Area 1-2
Purpose and Need for the Action 1-2
Relationships for the RMP to BLM Policies, Programs and Other Plans 1-2
Planning Process and Criteria 1-6
Issues 1-7
Western Oregon Digital Data Base 1-8

Maps

1-1 General Location 1-3
1-2 Land Status 1-4

Chapter 2

Alternatives to be Analyzed and Alternatives Dropped from Detailed Study 2-2
Management Direction Common to All Alternatives 2-4
  General 2-4
  Water Quality 2-4
  Timber 2-6
  Special Status (including Threatened and Endangered) Species Habitat 2-10
  Wildlife and Fish Habitat 2-11
  Special Areas 2-12
  Recreation 2-12
  Wild and Scenic Rivers 2-12
  Wilderness Study Area 2-13
  Visual Resources 2-13
  Cultural Resources 2-13
  Land Tenure 2-14
  Rights-of-Way 2-16
  Access 2-17
  Withdrawal 2-17
  Energy and Minerals 2-17
  Roads 2-18
  Noxious Weeds 2-18
  Hazardous Materials 2-18
  Fire 2-18
  Wildfire 2-18
  Fuels Management 2-19

Management Direction by Alternative 2-19
  No Action Alternative 2-19
  Alternative A 2-21
  Alternative B 2-23
  Alternative C 2-26
  Alternative D 2-31
  Alternative E 2-36
  Preferred Alternative 2-40
Requirement for Further Environmental Analysis 2-47
Use of the Completed Plan 2-47
Cost of Management 2-49
Management of Newly Acquired Lands 2-50
Monitoring the Resource Management Plan 2-50

Research 2-50
Summary of Impacts 2-50

Maps

2-1. Land Tenure Management Zones 2-68

Figures

2-1 Process for Changing the RMP 2-66
2-2 Availability of Forest Lands and Woodlands for Timber Production by Alternative 2-67

Chapter 3

Introduction 3-2
Lands and Transportation 3-2
Air Resources 3-4
Soil 3-9
Water Resources 3-12
Vegetation 3-26
Riparian Zones 3-30
Wildlife 3-30
Fish 3-38
Special Status Species 3-39
Biological Diversity 3-47
Special Areas 3-53
Cultural and Paleontological Resources 3-57
Visual Resources 3-58
Wild and Scenic Rivers 3-58
Recreation 3-59
Timber Resource 3-66
Energy and Mineral Resources 3-75
Socioeconomic Conditions 3-75
Rural Interface Areas 3-83

Maps

3-1 Right-of-Way Corridors 3-6
3-2 Sensitive Air Quality Areas 3-8
3-3 Analytical Watersheds 3-16
3-4 Municipal/Community Watersheds 3-18
3-5 Fishery Streams 3-40
3-6 Spotted owl Sites 3-48
3-7 Special Areas 3-54
3-8 Visual Resource Inventory Classes 3-60
3-9 Designated Wild and Scenic Rivers 3-62
3-10 Recreation Sites, Areas, and Trails 3-68
3-11 Mineral Potential 3-78
3-12 Rural Interface Areas 3-84

Figures

3-1 Watershed Condition Index 3-25
3-2 Seral Stages 3-29
3-3 Riparian Areas - Vegetation Type 3-32

Chapter 4

Introduction 4-2
Mitigation 4-3

Effects of Alternatives

- Effects on Global Climate 4-5
- Effects on Air Resources 4-6
- Effects on Soil 4-7
- Effects on Water Resources 4-12
- Effects on Biological Diversity 4-17
- Effects on Vegetation 4-32
- Effects on Riparian Zones 4-41
- Effects on Wildlife 4-44
- Effects on Fish 4-55
- Effects on Special Status Species 4-58
- Effects on Special Areas 4-73
- Effects on Cultural Resources 4-75
- Effects on Visual Resources 4-75
- Effects on Wild and Scenic Rivers 4-77
- Effects on Recreation 4-78
- Effects on Timber Resource 4-82
- Effects on Energy and Mineral Resources 4-89
- Effects on Socioeconomic Conditions 4-92
- Effects on Rural Interface Areas 4-100

Consistency with Other Plans and Programs 4-101

Figures

- 4-1 Annual Prescribed Fire Fuels Consumption by Alternative 4-8
- 4-2 Relative Abundance of Seral Stages, Short Term (10 years) by Alternative 4-20
- 4-3 Relative Abundance of Seral Stages, Long Term (100 years) by Alternative 4-21
- 4-4 Acreage Expected to Attain Old-Growth Structural Characteristics, Within 100 Years by Alternative and Timber Production Status 4-22
- 4-5 Forest Seral Stages and Canopy Condition, Short Term (10 years) by Alternative 4-26
- 4-6 Forest Seral Stages and Canopy Condition, Long Term (100 years) by Alternative 4-27
- 4-7 Roseburg Ten Year Biodiversity, Number of Old Growth Blocks 4-28
- 4-8 Roseburg Ten Year Biodiversity, Total Area of Old Growth Blocks 4-29
- 4-9 Roseburg Ten Year Biodiversity, Number of Interior Old Growth Blocks 4-30
- 4-10 Roseburg Ten Year Biodiversity, Total Area of Interior Old Growth 4-31
- 4-11 Roseburg Ten Year Biodiversity, Number of Combined Mature and Old Growth Blocks 4-33
- 4-12 Roseburg Ten Year Biodiversity, Total Area of Combined Mature and Old Growth Blocks 4-34
- 4-13 First Decade Changes in Spatial Relationship of Old Growth Blocks, Within Biological Corridors and for the Entire District, Alternative A 4-35
- 4-14 First Decade Changes in Spatial Relationship of Old Growth Blocks, Within Biological Corridors and for the Entire District, Alternative B 4-36
- 4-15 First Decade Changes in Spatial Relationship of Old Growth Blocks, Within Biological Corridors and for the Entire District, Alternative C 4-37
- 4-16 First Decade Changes in Spatial Relationship of Old Growth Blocks, Within Biological Corridors and for the Entire District, Alternative D 4-38
- 4-17 First Decade Changes in Spatial Relationship of Old Growth Blocks, Within Biological Corridors and for the Entire District, Alternative E 4-39
- 4-18 First Decade Changes in Spatial Relationship of Old Growth Blocks, Within Biological\ Corridors and for the Entire District, Preferred Alternative 4-40
- 4-19 Changes in Suitable Spotted Owl Habitat by Alternative, All Provinces - BLM Lands - Roseburg District 4-65
- 4-20 Changes in Suitable Spotted Owl Habitat by Alternative, All Western Oregon Provinces - BLM Lands 4-65
- 4-21 Total Suitable Spotted Owl Habitat, Western Ore. - USFS & BLM Lands by Alternative 4-66

Chapter 5

Introduction 5-2
List of Preparers 5-2
Other Agencies and Organizations Contacted 5-4
BLM Planning and Resource Interrelationships with Other Agencies 5-5
The Resource Management Planning Process 5-7
Public Involvement Summary 5-7

Chapter 1
Introduction

The Planning Area

The Roseburg District Resource Management Plan/ Environmental Impact Statement (RMP/EIS) analyzes impacts associated with managing 423,928 acres of land in Oregon administered by the U.S. Department of the Interior, Bureau of Land Management's (BLM) Roseburg District. Within the planning area there are also 1,717 acres of non-federal land with federal subsurface mineral estate administered by BLM (see Table 3-1).

The land is located in western Oregon as shown on Map 1-1 and 1-2. The portions of the planning area where BLM-administered lands lie are in the western foothills of the Cascade Range, the Oregon Coast Range, and Klamath Mountains. They are predominately forested with stands of Douglas-fir mixed conifer, and drain into the Umpqua River or a number of different coastal rivers. Population is centered in and near Roseburg.

Purpose and Need for the Action

The Resource Management Plan will establish guidelines for the management of BLM-administered land in the Roseburg District. It will provide a comprehensive framework for allocating and managing the BLM-administered resources in the area for the next 10 years, within the principles of multiple use. It will supersede and replace four management framework plans (MFP) covering the same area, completed in 1983. The MFPs were originally expected to remain in effect for 10 years but BLM later decided that its western Oregon plans for the 1990s should be prepared concurrently, to facilitate appropriate analysis of cumulative effects. Thus, replacement of some MFPs was scheduled earlier than 10 years while replacement of other, earlier MFPs, is occurring slightly later than 10 years.

This RMP/EIS is focused on resolving 11 key planning issues associated with management of BLM-administered lands in the Roseburg District. These issues are discussed under "Issues and Concerns". The issues were identified through public scoping, which started in September, 1987, and internal analyses as described in Chapter 5 and Appendix 1-1. These same 11 issues are being addressed in five other western Oregon RMPs being prepared concurrently.

The preferred alternative identified in this document was selected after consideration of public comments at open house meetings and in correspondence, comments from other government agencies, BLM staff analysis of the consequences of alternatives, legal mandates of Federal laws and executive orders, and the requirements of Bureau policy. The draft RMP was developed under the requirements of the Federal Land Policy and Management Act (FLPMA) through the use of an interdisciplinary planning process. This RMP/EIS document is written in compliance with the National Environmental Policy Act (NEPA) and related Council on Environmental Quality regulations. A list of the major federal laws and executive orders affecting BLM land management in western Oregon is provided in Appendix 1-2.

Relationship of the RMP to BLM Policies, Programs and Other Plans

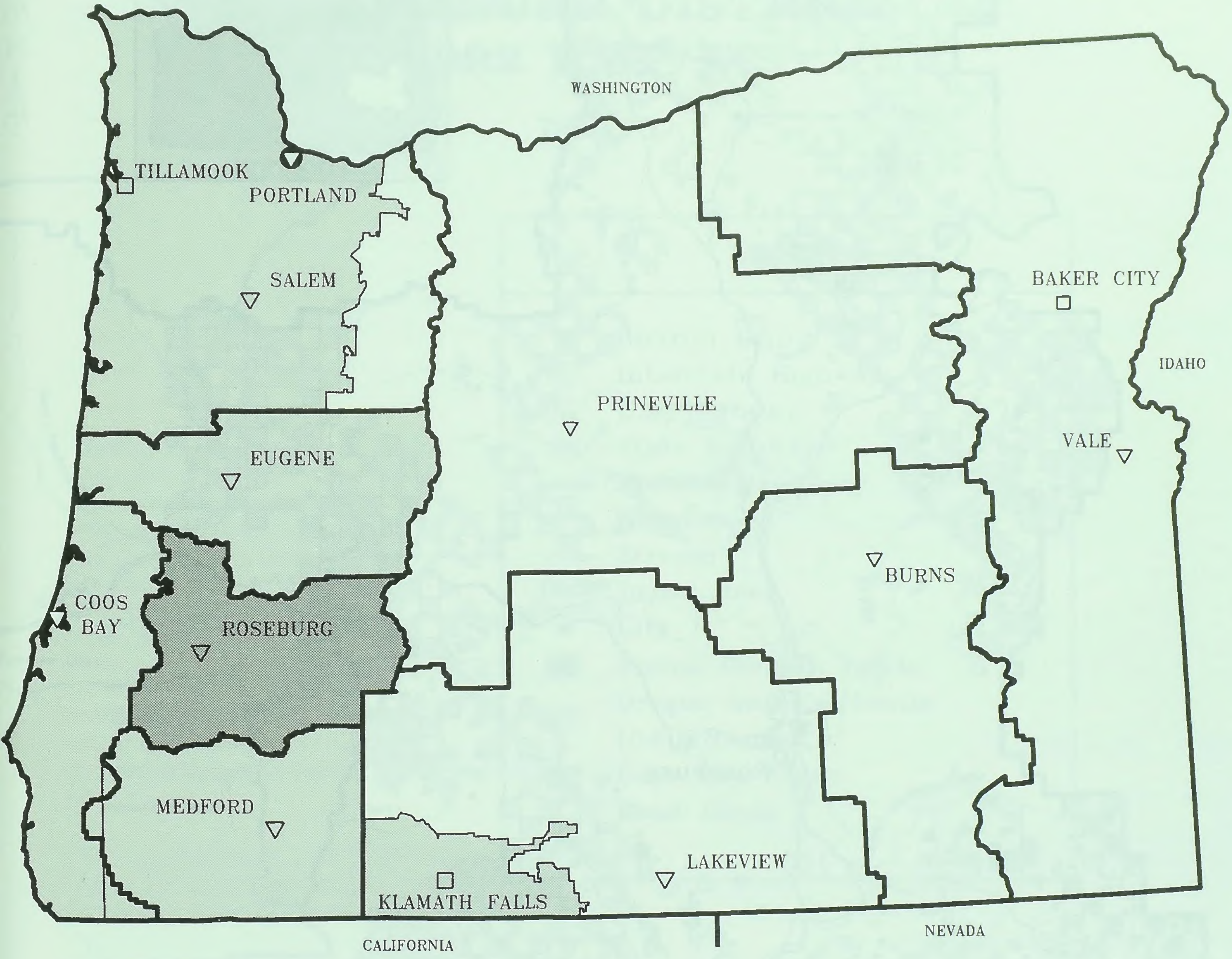
BLM in Oregon is developing five other RMPs (Medford, Klamath Falls, Coos Bay, Eugene, Salem) concurrently with development of the Roseburg District RMP. The six RMPs together cover all BLM-administered lands in western Oregon. Some lands administered by the Eugene District to the north and the Medford District to the south and Coos Bay District to the west directly adjoin lands being addressed in the Roseburg plan. Cooperation is occurring in the planning for management of these lands.

The North Umpqua Wild and Scenic River Plan was developed in 1991 to respond to a specific Congressional mandate which designated the North Umpqua River a scenic river. The plan developed would not be changed by any of the RMP alternatives.

In 1987, the BLM completed a Record of Decision (ROD) for its Northwest Area Noxious Weed Control EIS. A copy of key elements of that ROD is included as Appendix 1-3 of this document. This RMP/EIS is tiered to that EIS, and the decisions made in that ROD are not addressed again in the RMP/EIS alternatives.

This RMP/EIS is tiered similarly to BLM's 1989 EIS, Western Oregon - Management of Competing Vegetation, regarding analysis of impacts of vegetation management activities on human health, and regarding all other impacts from the use of herbicides in management programs other than noxious weed control. A copy of the key elements of the ROD for that EIS is included as Appendix 1-4 of this document. The decisions made in that ROD are also not readdressed.

There are no wilderness study areas in the Roseburg District.



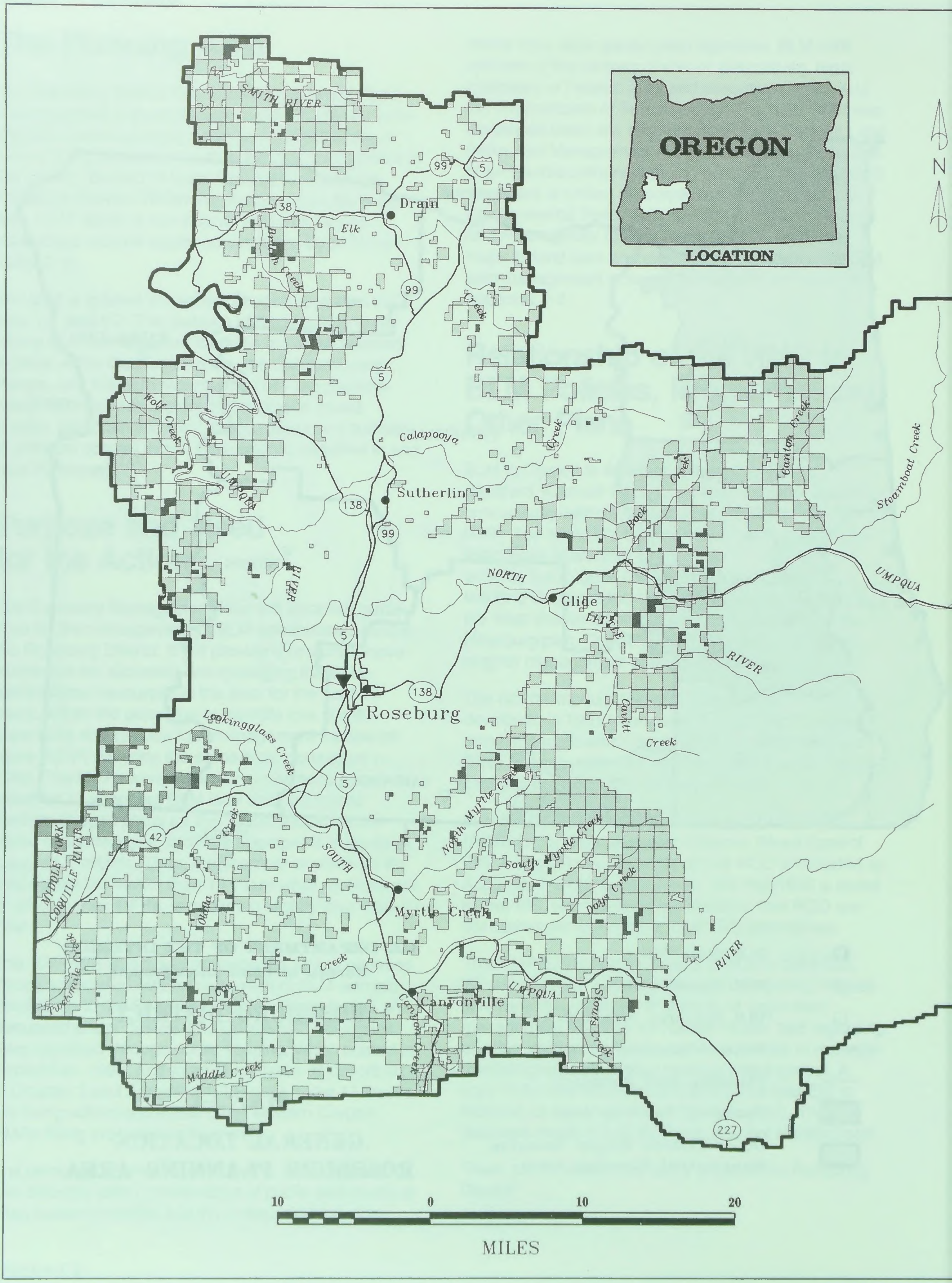
▼ BLM State Office
▽ BLM District Office
□ BLM Resource Area Office
— District Boundary
— Planning Area Boundary
▨ Roseburg Planning Area
▭ Other Western Oregon Resource Management Planning Areas

U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management

ROSEBURG DISTRICT

MAP 1-1

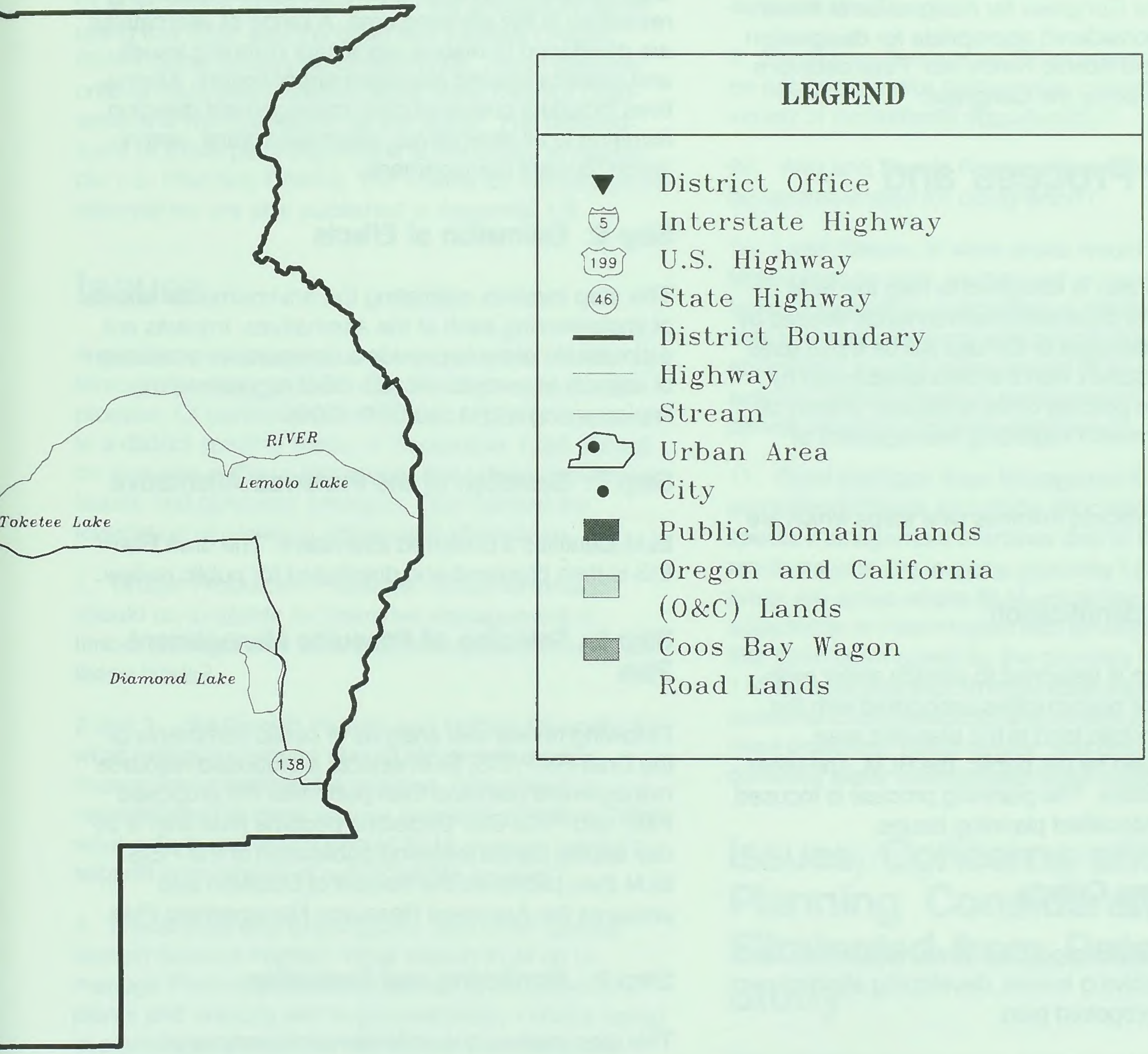
GENERAL LOCATION ROSEBURG PLANNING AREA


OREGON
LOCATION
N
SMITH RIVER
99
5
Drain
38
Elk
Brush Creek
99
Creek
5
Wolf Creek
Calapooya
Creek
Canton Creek
Steamboat Creek
UMPQUA
Sutherlin
138
99
Creek
Rock
RIVER
NORTH
UMPQUA
Glide
LITTLE
RIVER
5
138
Roseburg
Lookingglass Creek
Cavitt
Creek
5
North Myrtle Creek
42
Olalla Creek
MIDDLE FORK
COQUILLE RIVER
SOUTH
South Myrtle Creek
Days Creek
Myrtle Creek
Twelvemile Creek
Creek
Cow
RIVER
Canyonville
UMPQUA
Canyon Creek
Stouts Creek
Middle Creek
5
227
10
0
10
20
MILES

U.S. Department of the Interior
Bureau of Land Management

ROSEBURG DISTRICT
1992 RMP/EIS

DRAFT



LEGEND

- ▼ District Office
- 5 Interstate Highway
- 199 U.S. Highway
- 46 State Highway
- — District Boundary
- — Highway
- — Stream
- ● Urban Area
- • City
- ■ Public Domain Lands
- ▨ Oregon and California (O&C) Lands
- ▨ Coos Bay Wagon Road Lands

MAP 1-2: LAND STATUS

Any findings made in the record of decision for this RMP/EIS, that certain river segments studied herein are suitable for designation under the Wild and Scenic Rivers Act, will be a preliminary administrative recommendation. It will receive further review and possible modification by the Director, BLM; Secretary of the Interior; or the President of the United States. To facilitate that review, after completion of this RMP and its record of decision, BLM may prepare a separate legislative EIS and a study report to support recommendations to the Congress for designation of those river segments considered appropriate for designation under the Wild and Scenic Rivers Act. Final decisions have been reserved by the Congress.

Planning Process and Criteria

The planning process is designed to help the BLM identify the uses of BLM-administered lands desired by the public. Consideration of the use will be those uses to the extent consistent with the laws established by Congress and the policies of the executive branch of the federal government regarding management of those lands.

BLM's planning process involves nine steps which are described below.

Step 1: Issue Identification

This planning step is designed to identify major problems, concerns, or opportunities associated with the management of public land in the planning area. Issues are identified by the public, the BLM, and other governmental entities. The planning process is focused on resolving the identified planning issues.

Step 2: Planning Criteria

Planning criteria include policies, laws, regulations, and guidelines for resolving issues, developing alternatives, and choosing a proposed plan.

Step 3: Inventory and Data Collection

Certain kinds of biological, physical, social, or economic information needed to resolve the planning issues is collected and analyzed. Inventory information is used in determining how BLM-administered resources would also respond under each of the alternatives.

Step 4: Analysis of the Management Situation

The Analysis of the Management Situation (AMS) identifies the ways lands are currently managed in the planning area and opportunities to manage these lands differently.

Step 5: Formulation of Alternatives

BLM formulates a range of alternatives for managing resources in the planning area. A range of alternatives are developed to resolve significant planning issues and address specific management concerns. Alternatives include a preferred plan, management direction common to all alternatives, alternative plans, and no action (current management).

Step 6: Estimation of Effects

This step involves estimating the environmental effects of implementing each of the alternatives. Impacts are estimated in order to provide a comparative evaluation of impacts in compliance with CEQ regulations for implementing NEPA (40 CFR 1500).

Step 7: Selection of the Preferred Alternative

BLM identifies a preferred alternative. The draft RMP/EIS is then prepared and distributed for public review.

Step 8: Selection of Resource Management Plan

Following review and analysis of public comments of the Draft RMP/EIS, BLM selects a proposed resource management plan and then publishes the proposed RMP and Final EIS. Decisions become final after a 30 day appeal period following publication of the FEIS. BLM then publishes the Record of Decision and prepares the Approved Resource Management Plan.

Step 9: Monitoring and Evaluation

This step involves the collection and analysis of resource condition and trend data to ensure the plan is accomplishing its objective of resolving the identified issues and achieving other desired results. Monitoring continues from the time the RMP is adopted until changing conditions require revision of the entire plan or any portion of it.

Publication of this document constitutes completion of step seven. Public involvement has occured at several steps in the process (see Chapter 5 for additional summary of public involvement). A summary of the

AMS was published in February 1991. Where BLM manages the subsurface mineral estate and the surface is non-federal or administered by another federal agency, the RMP/EIS addresses only the management of the BLM-administered mineral resources.

Planning criteria sets out the legal parameters and management goals that guide and direct the preparation of the RMP. Planning criteria were developed by BLM's Oregon State Director for the process of developing this RMP and the other five western Oregon RMPs being developed concurrently. These planning criteria have been referred to as State Director Guidance and were reviewed by the public. The development of those planning criteria is discussed in Appendix 1-5, Planning Criteria. The criteria for formulation of alternatives are also published in Appendix 1-5.

Issues

A number of issues and concerns were identified through the early phases of public involvement in the process. Of particular relevance were public responses to a district scoping mailer of September 1986. Based on a review of those comments, the following planning issues and concerns emerged. They formed the foundation of planning criteria and alternatives.

1. Timber Production Practices: Which forestland should be available for intensive management of timber products and what practices should be used on those lands?

2 and 3. Old-Growth Forests and Habitat Diversity: To what extent and where should old-growth and/or mature forest habitats be retained, maintained or reestablished to meet various resource objectives? To what extent and where should BLM manage habitat to support populations of native wildlife species?

4. Threatened and Endangered (and other Special Status) Species Habitat: What should BLM do to manage Federally listed threatened or endangered plants and animals and to prevent future Federal listing of plants and animals as threatened or endangered species?

5. Special Areas: What areas on BLM-administered lands need special management to prevent irreparable damage to important historic, cultural or scenic values; to protect botanical or fish and wildlife resources or other natural systems or processes; and to protect life and safety from natural hazards? Which of these areas should be formally designated as Areas of Critical Environmental Concern (ACEC)?

6. Visual Resources: Which, if any, areas of BLM lands should be managed to reduce visual impacts or enhance visual (scenic) quality?

7 and 8. Stream/Riparian/Water Quality: Where and how should riparian zones be managed to protect and improve water quality, fisheries, and wildlife habitat? What actions should be undertaken to comply with state water quality standards? What should BLM do to manage for special needs such as municipal and domestic use?

9. Recreation Resources: What areas or sites should be designed and/or managed to protect or enhance a variety of recreational opportunities?

9A. Wild and Scenic Rivers: What, if any, rivers should be recommended for designation?

10. Land Tenure: In what areas would BLM-administered lands be sold, exchanged or transferred out of federal ownership under other authorities to improve management efficiency and benefit resource program objectives? In what areas would BLM attempt to acquire lands to improve management efficiency and benefit resource program objectives?

11. Rural Interface Area Management: Which BLM-administered lands should be allocated to receive special management practices due to the concerns of residents who live in close proximity? (Rural interface areas are areas where BLM-administered lands are adjacent to or intermingled with privately owned lands that have been zoned by the counties for occupancy of 1 to 20 acre size lots. In most rural interface areas concerns of the residents are related to forest management practices, visual quality, and potential effects on domestic water sources and water supplies.)

Issues, Concerns and Other Planning Considerations Eliminated from Detailed Study

The following issues were eliminated from consideration as primary factors in the formulation of alternatives, for the reasons cited:

- Grazing/range management - There are only a few seasonal grazing leases issued by BLM in the planning area. These few leases do not pose significant resource conflicts.

- Mineral resources - Mineral development activity on BLM-administered lands in the planning area has been insignificant in recent years, and is expected to continue to be minor and manageable.

The following topics were eliminated from study, for the reasons described:

- Use of herbicides - This topic was fully analyzed in BLM's 1989 EIS, "Western Oregon Management of Competing Vegetation", and BLM's 1986 EIS, "Northwest Area Noxious Weed Control", as supplemented in 1987.
- Effects on wilderness - There were no lands found suitable for wilderness study areas in the Roseburg District.
- Effects on agriculture - BLM activities in the planning area are not expected to have measurable effects on agriculture.
- Effects on wind and hydropower resources - There are no known wind power or hydropower proposals affecting BLM-administered lands in the planning area that are legally implementable.

The following effects, sometimes perceived as relevant planning topics, were eliminated from study for the reasons described:

- Effects on prime and unique farm lands, and paleontological resources - No discernable effects are anticipated.
- Effects on energy use - Previous analyses (e.g., the Roseburg Timber Management EIS) have shown that effects of BLM management activities in the planning area are not significant.

Western Oregon Digital Data Base

To support the RMP process BLM developed the Western Oregon Digital Data Base (WODDB), a geographic information systems (GIS) digital (computer) data base.

Due to the checkerboard pattern of land ownership, base thematic data was mapped on a total of seven million acres to obtain coverage of BLM's 2.4 million acres in western Oregon. All base themes were derived from 1985/86 aerial photography and then digitized at 1:4800 scale. Base data themes include transportation, gross vegetation, hydrology, topography, and cultural features. Base theme mapping, except topography, is complete. This information was mapped using Automated Digitizing System (ADS) software.

Resource data themes were mapped at a scale of 1:12,000 or more, depending on the theme. There are approximately 75 resource themes captured on the 2.4 million acres of BLM-administered lands. They include soils, forestry, big game, minerals, watersheds, spotted owls, and recreation. It is anticipated that additional themes will be added to meet future day-to-day resource management operational needs.

Although the majority of BLM-administered lands in western Oregon is covered, within the Roseburg District, four townships with only minor acreage of BLM-administered land were excluded from the WODDB project.

BLM ownership is based on the Public Land Survey theme (PLS) in GIS and from BLM's master title plats (MTP). As the GIS ownership data is computer generated, it would differ from that displayed in other documents which were determined from BLM's MTPs. The MTP acreages are computed from cadastral survey notes and represent official acres. The MTP acre figures would be used in realty actions while GIS derived acreages would be used in other resource management programs in this document. Slight variations exist between the acreage figures based upon the MTPs and those generated through GIS.

BLM is using GIS technology based on the Map Overlay and Statistical System (MOSS) family of software on Prime computers in the six western Oregon districts and the State Office in Portland. Many base and resource themes have data base information associated with them. The data base information is stored in attribute files.

To build the WODDB data base, standards for each of the themes were developed and agreed upon by BLM's western Oregon districts. The WODDB Data Entry Handbook was developed with district input to provide a comprehensive and concise set of instructions, including quality control assurance, so that all of the data themes are standard from district to district.

There will actually be two WODDB data bases: one for doing the Resource Management Plans, in which the data is "frozen" in time; and one for operational uses, in which the data will be updated regularly. Updating the operational WODDB data will be important because of the high frequency of changes that need to be made for many of the resource themes, particularly roads and operations inventory.

The WODDB data base has been used in three ways in the planning effort:

1. To compute and aggregate resource data for each planning area, and display maps of that data.
2. To help design alternatives in accordance with criteria established for alternative formulation and to display maps of those alternatives.
3. To facilitate analysis of some of the consequences of those alternatives.

Chapter 2
Description of the Alternatives Including the Preferred Alternative

Alternatives to be Analyzed and Alternatives Dropped from Detailed Study

There are seven alternatives, including the Preferred Alternative, for which impacts are analyzed in Chapter 4. These include:

No Action - This alternative would entail no change from the management direction established in BLM's current management framework plans (except where Congress has since enacted legislation prescribing different management direction for specific geographic areas or transferring specific lands to the administration or ownership of other parties).

This alternative would emphasize timber production and other economically important values to contribute to community stability, consistent with the variety of other land uses. A system of blocks of old-growth and mature forest would be retained to contribute to ecological functions important to forest productivity. Restrictions of disturbance of fragile sites and riparian zones would mitigate adverse impacts on soil productivity and water quality. Lands would be allocated for the specific purpose of protecting unique natural values and special status species, including endangered species. Mitigation measures would be used to moderate impacts on fisheries, wildlife, cultural resources and other non-timber values.

Alternative A - This alternative would emphasize a high production of timber and other economically important values on all lands, and contribute to community stability. It would produce the highest sustained yield of timber on all suitable forest lands legally available for harvest. It would also manage threatened and endangered species habitat and habitats of species proposed for such status as legally required. In addition, it would protect habitats of other species with high potential for listing if known only to exist on BLM-administered lands. One of nine existing Special Areas would be retained. To meet legal requirements for protection of wetlands and water quality, as well as protecting anadromous fish habitat and other relevant values, riparian zones would be managed according to requirements of the Oregon Forest Practices Act and the Federal Water Pollution Control Act. Recreation management emphasis would be on existing recreation sites (including the North Umpqua Wild and Scenic Corridor) and trails of high use and dispersed motorized recreation uses. Land tenure adjustments which enhance BLM long-term sustained yield timber harvest opportunities would be emphasized. No special timber management actions or mitigating measures would be provided in rural interface areas.

Alternative B - This alternative would emphasize timber production and other economically important values to contribute to community stability, consistent with the variety of other land uses, on Oregon and California Railroad (O&C) lands and Coos Bay Wagon Road (CBWR) lands. Public domain lands having greater importance for non-timber values and uses would be managed primarily for the maintenance of the non-timber values and uses. A system of blocks of old-growth and mature forest would be retained to contribute to ecological functions important to timber productivity. Habitat of threatened and endangered species and species proposed for such status would be protected. Other special status species would be protected to the extent they would not interfere with high timber production. Timber harvest would not be planned in riparian zones of important waters (third order and larger streams and wetlands). Seven of nine existing Special Areas would be retained, one existing Special Area would be expanded and one new one designated. No rivers (other than the already designated North Umpqua River) would be found suitable for designation as Wild and Scenic. Scenic resources would be managed in selected special status and high use areas. Recreation management would provide for a wide range of developed and dispersed recreation uses.

Land tenure adjustments of O&C and CBWR lands would be made primarily to acquire lands which would enhance timber management opportunities. Exchanges of public domain lands would be made to benefit one or more of the resources managed. Alternative forest management practices would be applied in rural interface areas which include lands zoned for occupancy of one to five-acre lots within 1/4-mile of BLM-managed lands.

Alternative C - This alternative would provide timber production to contribute to community stability consistent with the variety of other land uses. It would emphasize retention and improvement of biological diversity, retaining a system that maintains some old-growth and mature forest, stressing connectivity and focusing on areas where special status plant and animal species cluster. Habitats of threatened and endangered species, species proposed for such status, and species with a high potential for federal listing as threatened or endangered would be protected. Other species of related concern would be protected primarily through the emphasis on biological diversity. Timber harvest would not be planned in or immediately adjacent to riparian zones of important waters. Eight of nine existing Special Areas would be retained, four existing Special Areas would be expanded and two new ones would be designated. No rivers in addition to the North Umpqua would be recommended suitable for designation as Wild and Scenic. Scenic resources would be managed in selected special status and high use areas. Recreation management would provide for a wide range of recreation opportunities, emphasizing dispersed use. Special forest management practices would be applied where apropriate in rural interface areas which include lands within 1/4-mile of areas zoned by Douglas County for one to five-acre residential lots. Land tenure adjustments would be made to benefit a variety of uses and values.

Alternative D - This alternative would emphasize management and enhancement of values such as diversity of wildlife habitat, dispersed non-motorized recreation opportunities, and scenic resources, consistent with a variety of other land uses including some timber production. Spotted owl habitat would be protected in accordance with the Conservation Strategy for the Northern Spotted Owl(Thomas et al. 1990). Species with a high potential for federal listing as threatened or endangered and other special status species would be protected. Timber harvest would not be planned in and adjacent to riparian zones of important waters or their immediate tributaries. Six of nine existing Special Areas would be retained, four existing Special Areas would be expanded, and three new ones designated. No additional rivers would be found suitable for designation as Wild and Scenic. All identified scenic resources would be managed as inventoried. Recreation management would emphasize dispersed non-motorized opportunities. Special timber harvest and forest management practices would be applied in rural interface areas which include lands within 1/4-mile of areas zoned for one to five-acre residential lots. Land tenure adjustments would be made to benefit a variety of uses and values.

Alternative E - This alternative would emphasize protection of older forests and management and enhancement of values such as dispersed non-motorized recreation opportunities and scenic resources. A sustained yield of timber would be produced consistent with the emphasis on these other values. All old-growth forest stands would be retained. Species with a high potential for Federal listing as threatened or endangered and other special status species would be protected. Timber harvest would not be planned in, or adjacent to, riparian zones. Six of nine existing Special Areas would be retained, four existing Special Areas would be expanded, and three new ones designated. Two additional rivers would be found suitable for designation as Wild and Scenic, with a recreation classification. All identified scenic resources would be managed and some visual resource protection would be provided for all lands. Recreation management would emphasize dispersed non-motorized opportunities. Special timber harvest and forest management practices would be applied in rural interface areas. Land tenure adjustments would be made to emphasize enhancement of nontimber uses and values. Alternative forest management and timber harvest practices would be applied in rural interface areas which include lands zoned for occupancy of one to five-acre lots within 1/2-mile of BLM-managed lands.

Preferred Alternative -This alternative would provide a moderate level of timber production to contribute to community stability consistent with managing for biological diversity, recovery of the northern spotted owl, maintaining areas of old-growth, providing for regional and subregional connectivity, maintaining biological legacies and a variety of other land uses. All five existing ACECs would be retained, four additional areas that are currently managed as special areas would receive ACEC designation, and one new area would be designated as an ACEC. Habitats of threatened and endangered species, species with a high potential for federal listing, and other special status species would be protected. Timber harvest or other surface disturbing activities would not be planned in riparian management areas. No rivers would be found suitable for designation as Wild and Scenic. All identified scenic resources would be managed. Recreation management would be emphasized. Special forest management practices would be applied in rural interface areas which include lands within 1/4-mile of areas zoned for one to five-acre residential lots. Exchanges or acquisitions of lands would be made to benefit a variety of uses and values.

Allocations and management by alternative are compared in Table 2-1. All tables in this chapter are located at the end of the chapter.

In the scoping of the plan a number of alternatives, or potential elements of alternatives, were considered but eliminated from detailed analysis. These alternatives are discussed in the Summary of Scoping in Appendix 1-1. Some of them are further addressed in sensitivity analysis (see Appendix 4-1).

California Lady Slipper.
Photo by Russ Holmes

Management Direction Common to all Alternatives

The following management direction would apply fully to all alternatives analyzed but not necessarily to the No Action Alternative and alternative C. Significant exceptions to this direction are noted in the descriptions of those two alternatives. Exceptions are also noted where management direction does not apply to the preferred alternative.

General

Land management practices of adjacent landowners would be considered during site-specific timber management planning and other specific activity and project planning.

Special management will be provided for the tree species Pacific yew, the bark of which is the only currently approved (by the Food and Drug Administration) source of taxol, a promising agent for treatment of a variety of cancers. Special management will address harvest of the yew as well as its regeneration and the possible extraction of taxol without harvesting individual trees. Pacific yew management and collection on federal lands will be the subject of a separate environmental impact statement (EIS) being prepared by the U.S. Forest Service, with BLM as a cooperating agency. The draft EIS is expected to be released later this year.

Inherent in all management practices is a goal of maintaining long-term site productivity of soils. Achievement of this goal would be accomplished by using best management practices (BMP) and minimizing disturbance of fragile areas (see Appendix 2-1 for a list of BMPs and a description of management guidance for fragile sites).

All BLM prescribed fire activities which could affect air quality would be conducted in accordance with the Oregon State Implementation Plan as administered by the Department of Environmental Quality, and the Oregon Smoke Management Plan as administered by the Department of Forestry.

The BLM would aid and support the Oregon Economic Development Department's efforts to help communities develop and implement alternative economic strategies as a partial substitute for faltering timber-based economies. Aid and support would consist mostly of coordination and prioritization of BLM recreation and fisheries development activities. These activities are mutually perceived as benefiting the identified economic strategies.

Water Quality and Riparian Areas

To assure protection of water and water-dependent resources, BLM would continue to implement a nonpoint source (NPS) management program in cooperation with the U.S. Environmental Protection Agency and the Oregon Department of Environmental Quality (DEQ).

Section 319 of the Clean Water Act directs the states to prepare a statewide management plan which outlines a NPS pollution control program. Oregon's NPS management program includes two goals for NPS prevention and control efforts: (1) the protection, in every waterbody, of water quality necessary for full support of the various designated beneficial uses of water, and (2) the maintenance of "high quality" waters wherever they are found. The Clean Water Act as amended directs federal agencies to comply with state water quality requirements to restore, maintain, and enhance water quality necessary to protect existing beneficial uses. Oregon's NPS management plan requires the BLM to continue coordination with DEQ for implementation of best management practices (BMPs) which protect the beneficial uses of water. BMPs are those land and resource management techniques designed to maximize beneficial results and minimize detrimental results. BMPs are listed in Appendix 2-1.

Management activities would be consistent with Oregon's adopted Statewide Water Quality Management Plan for forest practices, and comply with Oregon's Water Quality Standards and Guidelines for the Umpqua Basin (OAR 340-41-282, OAR 340-41-285) and the South Coast Basin (OAR 340-41-322, OAR 340-41-325). BMPs would be selected based on site-specific conditions, feasibility, and the water quality standards for waters potentially affected. Mining, recreation, off-road vehicle use, fire management and other activities would be regulated to protect water quality.

Watershed management practices would be designed to comply with Oregon's Antidegradation Policy which describes the conditions under which water quality may be lowered and when it must be maintained or enhanced. The current Antidegradation Policy states that degradation of water quality will not be permitted should it interfere with or become injurious to the established beneficial uses of water within designated reaches of National Wild and Scenic Rivers (OAR 340-41-026).

Floodplains and wetlands will be protected in accordance with Executive Orders 11988 and 11990. The executive orders require that: 1) Floodplains and wetlands be identified; 2) activities which affect floodplains or wetlands must be investigated to assess potential changes in their values; 3) actions in floodplains or wetlands are required to minimize impacts to those areas; and 4) actions and their impacts must be formally declared and the public notified.

New roads and associated structures would be located, designed, and constructed to minimize stream crossings and the risk of soil or other material entering streams or other waters. Excavation would be limited to the practical amount needed to meet appropriate road standards. Exposed soil would be seeded or protected where necessary to keep surface erosion within accepted standards. Logging, road building and slash disposal methods would be designed to minimize the number and/or size of mass soil movements.

Riparian Management Areas (RMA) would be established on each side of streams, lakes, ponds, and other waters.

The exclusion of Fragile Non-Suitable sites from the timber production base through the Timber Production Capability Classification (TPCC) process, and the commitment in the RMP to design features to minimize soil erosion and otherwise protect streams are the foundation for the effort to minimize the effects of land management activities on surface water. Analysis of cumulative effects by analytical watersheds or their subdrainages in the EIS for this RMP may guide overall timber sale scheduling during the life of the plan. See the discussions of Requirement for Further Environmental Analysis and Use of the Completed Plan, later in this chapter.

Planning for chemical uses would provide for protection of both surface water and ground water. Chemicals used would include herbicides, pesticides, fertilizers, and fire retardant chemicals. Application and monitoring of herbicides would be done in accordance with BLM's "ROD, Western Oregon Program, Management of Competing Vegetation", 1991.

The management goal in watersheds that provide surface water to municipalities (domestic uses) would be to maintain existing water quality. Management in municipal watersheds is subject to agreement with the cities of Drain, Riddle and Canyonville through memorandums of understanding, and with the City of Myrtle Creek through a special use permit.

The following constraints would apply to management in and adjacent to riparian zones:

- No timber harvest would be planned as part of the sustained yield timber management program within a riparian management area extending a minimum of 50 feet horizontal distance and an average distance that is wider, which would vary by alternative (see Table 2-1) on each side of perennial (generally 3rd order and larger) streams. Some tree cutting or timber harvest activities could occur there, however, to achieve resource management objectives. These activities may include road construction, enhancement of fish and wildlife habitat, safety along roads or within harvest areas, and yarding corridors to facilitate timber harvest outside the RMA.
- Brush, hardwoods, and non-merchantable vegetation would not be cut or slashed in a strip 25 feet wide, measured horizontally on each side of all intermittent (generally first and second order) streams, whenever timber harvest activities occur other than those associated with road construction.

The following standards would be followed in riparian management areas:

- Yarding corridors through riparian management areas would be restricted to the minimum number feasible, with the maximum width of any corridor being 50 feet.
- Removal of logs through the corridors would require either full log or one end suspension.
- All trees to be felled adjacent to riparian management areas would be directionally felled to protect the riparian management area.
- Conifers and woody riparian species would be planted in riparian areas adjacent to streams where previous management activities have removed them. Placement of woody debris, creation of snags, or planting of conifers or riparian species would be used where appropriate to enhance riparian conditions.

Agreements would be pursued with private land owners and other land management agencies for certain riparian areas within the district to help minimize impacts from timber management, grazing, or other activities.

Timber

Timber sale contracts, usually awarded on a competitive basis, are the means of accomplishing all timber harvest and many forest development practices. The standard and special provisions (which include mitigating measures) in a contract set forth the performance standards to be followed by the contractor in carrying out the action in accordance with applicable laws, regulations and policies. In contract preparation, selection of special provisions is governed by the scope of the action to be undertaken and the physical characteristics of the specific site. Standard provisions of the basic timber sale contract, Bureau Form 5450-3, are applicable for all timber sales. Bureau manuals and manual supplements provide a variety of approved special provisions for use, as appropriate, in individual contracts. The combination of selected special provisions constitutes Section 41 of the timber sale contract. Maintaining or enhancing water quality and long-term soil/site productivity will be inherent in all timber harvest and production practices .

Transportation System

New roads would be kept to the minimum needed for management, and would be located, designed, and constructed to standards appropriate to the expected road use and the resource values affected. BLM Oregon Manual Supplement H-5420-1 would be used in preparing road construction requirements for timber sale contracts. (Copies of Supplement H-5420-1 are available from the district office on request.) Construction standards (i.e., stream crossing requirements, subgrade width, ditch, cut-and-fill slope requirements, and type of surfacing) would be determined during the annual timber sale planning process.

Timber Harvest

The allowable sale quantity (ASQ) for each alternative has been calculated using a computer program called TRIM-PLUS. The capabilities of TRIM-PLUS and the rationale for selection of the model are discussed in Appendix 2-2. The sustainable ASQ has been calculated in cubic feet. Timber sales under the plan will be sold according to cubic foot measure.

On lands allocated primarily for timber production, clearcut harvesting would be used where it is silviculturally appropriate to accomplish forest management objectives, including cost effective management and assurance of timely reforestation. Under those criteria, the timber harvest method to be commonly employed would be clearcut harvesting, except in Alternative C and the Preferred Alternative. Appendix 2-3 discusses timber harvest methods, silvicultural systems, and the rationale for use of clearcutting.

Timber harvest would be accomplished by a mix of aerial, cable, or ground yarding systems. The logging systems and the degree of log suspension are design features that would be employed for watershed protection, to minimize soil damage and to minimize damage to residual trees in partial cut operations. BLM Oregon Manual Supplement H-5420-1 would guide selection of harvesting techniques for timber sale contracts.

In timber sales involving ground yarding systems, skid trails (including trails from previous harvest entries) would be planned to have insignificant (less than one percent) growth-loss effect. Skid trails would affect less than 10 percent of the land. Existing skid trails would be used as much as possible and new skid trails would be limited to slopes of less than 35 percent. Operation on these trails would minimize soil displacement and occur when soil moisture content provides the most resistance to compaction. Upon final harvest, all compacted trails, including skid trails from previous entries, would be tilled with a properly-designed subsoiler. For entries other than final harvest, skid trails would be selectively tilled.

Harvest unit size would be determined at the appropriate level given the site specific management objectives, such as wildlife habitat enhancement or salvage of timber damaged by fire, disease, insects, or wind. In addition, economic, logistical, and safety considerations may influence size.

Uneven-aged (selection) harvest methods would generally be employed where they are above-cost sales and either silviculturally preferred or favored to meet other resource or social objectives of the alternatives. In all cases, harvesting (either clearcut or selection) would be done in such a way that the land can be adequately restocked within five years.

Single tree selection would be employed for harvest of dead and dying timber (mortality salvage). Mortality salvage would take place on lands in the intensive timber production base to the extent consistent with wildlife and other resource objectives, and on other lands in the event of a major catastrophic event or when beneficial to wildlife, fish, or public safety.

Commercial thinning would be applied to intensively managed timber stands where practical and where research indicates increased gains in timber production are likely. The interval of treatment would range from 10 to 30 years, varying by site class, with poor sites having longer intervals.

Trees could be cut or removed from lands withdrawn from timber production under certain circumstances, unless their harvest would be inconsistent with other plan guidelines. Examples of circumstances under which trees may be harvested from these lands are:

- To harvest inclusions of trees within a harvest unit on lands mostly classified as suitable for timber production, to allow design of more logical management units and/or reduced road construction, thereby lessening net adverse environmental impacts.
- To salvage trees or stands killed or substantially damaged by fire, windthrow, or other natural disturbance.
- To control the spread of insect or disease outbreaks.
- To conduct experiments.
- To provide for the safety of forest users (this includes hazard tree removal in camp and picnic grounds, in administrative sites, and along trails and roads open to the public).
- To maintain or enhance fish and wildlife habitats.
- To improve the visual resource by opening scenic vistas.
- To provide guy line or tailhold trees where needed to facilitate logging on adjacent lands.
- To facilitate construction and maintenance of facilities such as roads, trails, power lines, communication facilities, administrative facilities, recreation facilities, etc.
- To eliminate interference with the operation of communication sites.

To the extent consistent with management direction of the various alternatives, forest products sales would be designed to encourage complete utilization of harvested timber including non-commercial species.

Site Preparation

Site preparation procedures would be used to prepare newly harvested and inadequately stocked areas for planting new trees. Four types of site preparation treatments (prescribed burning, herbicide application, and mechanical and manual techniques) would be utilized. BLM's "Record of Decision (ROD) Western Oregon Program - Management of Competing Vegetation", 1992, and BLM Oregon Manual Supplement H-5420-1 would be followed in selecting site preparation treatments, using an integrated vegetation management approach. (See Appendix 1-4 for a copy of the key elements of the ROD.)

Prevention is the preferred strategy in controlling competitive and unwanted vegetation. The goal is to prevent or reduce the need for future vegetation control by considering known ecological relationships on individual sites. Harvest activity would be designed to eliminate or reduce post-harvest treatment. Prevention seeks to detect and ameliorate conditions that cause or favor the presence of competing or unwanted vegetation in the harvest units before it interferes with management objectives. Prevention is in contrast to treatment.

Prescribed fire, the primary method of site preparation, would be conducted in accordance with Oregon Smoke Management Plan Rules and Directives administered by the Oregon Department of Forestry. Other considerations in the design and timing of prescribed fire would be expected effects on soils and biological processes and effectiveness in fire hazard reduction and site preparation. Prescribed fire would be avoided on highly sensitive soils (those soils recognized as unusually erodible, nutrient deficient or having low organic matter - Category I soils) in most instances. Any burning on such soils, if considered essential to obtain adequate reforestation, would be accomplished under carefully prepared prescriptions designed to minimize detrimental impacts on both the physical and chemical properties of the soil. On other soils, prescriptions would be designed to protect beneficial soil properties and result in moderate and low intensity prescribed fires. Standard operating procedures to be used for prescribed fire are further delineated in BLM's "ROD, Western Oregon Program, Management of Competing Vegetation", 1992 (See Appendix 1-4 for relevant portions of the ROD) and in BLM Manual 9214.

Vegetation control techniques reduce competition for light, moisture and soil nutrients during the tree seedling establishment period. Where considered the most appropriate treatment, herbicides would be used to control grasses, forbs, brush and non-commercial tree species, to increase seedling survival. Application and monitoring of herbicides would be done in accordance with BLM's "ROD, Western Oregon Program, Management of Competing Vegetation", 1992.

Herbicides would be applied aerially and by several ground methods, as site-specifically appropriate. The method selected would depend on costs, topography, equipment limitations, target plant species and their distribution, potential environmental impacts, and biological conditions. Most aerial herbicide applications would be accomplished by helicopters equipped with systems designed to limit herbicide application to the target areas.

Timing of herbicide treatment would be stringently controlled in relation to specified weather conditions such as temperature, humidity, and wind. Continuous project inspection of spraying operations is required. There is full authority for ordering cessation of operations based on adverse field conditions. Both equipment and operators are checked frequently by field project inspectors. Only registered chemicals would be used in accordance with label instructions on the container. Handling, storage, and application of chemicals would also be in accordance with the Oregon Forest Practices Rules (See the BLM Planning and Resource Interrelationships section, State and Local Government, in Chapter 5).

Manual site preparation would consist of brush pulling or cutting or hand piling of slash for burning.

Mechanical site preparation would consist of piling or windrowing of slash, brush, and unmerchantable stems. Track-type equipment with a brush blade would be restricted to areas with suitable soil types and slopes less than 35 percent. Track-type tractor site preparation operations would meet the following minimum conditions: 1) minimize piling of large woody material; 2) avoid displacing duff layers and topsoil into piles or windrows; 3) make only two machine passes (one round trip) over the same area; and 4) operate at soil moistures that maximize resistance to compaction. Special equipment or techniques that would achieve the same insignificant (less than one percent) growth-loss result may be used instead of the preceding techniques, especially on soils considered unsuitable for tractor-type operations. All compacted areas would be tilled with properly designed equipment.

Brush and Hardwood Conversion

Lands identified as available for timber production but currently growing primarily brush or hardwoods would be converted to appropriate conifer species unless the hardwoods would produce a higher net monetary return than conifers. Such actions would meet relevant tests of economic feasibility or justification and would be consistent with the objectives of an alternative. Conversion could include harvest of existing merchantable trees, slashing of non-merchantable trees, and other site preparation techniques as appropriate.

Planting

To achieve adequate reforestation as promptly as practical following timber harvest, harvested areas would be planted with indigenous commercial coniferous species (e.g., Douglas-fir, western hemlock, and western redcedar, etc.) generally within one year of the completion of harvesting and site preparation. Hardwoods would be encouraged on harvested sites where they would produce a higher net monetary return than conifers. Identified root disease centers would be planted with indigenous resistant tree species.

Planting stock would be nursery grown from seed collected on sites and at elevations similar to the specific project area. Genetically selected stock would also be nursery grown and used to the extent available (up to 50 percent in Alternative C and Preferred Alternative connectivity and Old-Growth Emphasis Area (OGEA)), in accordance with BLM's Western Oregon Tree Improvement Plan. Broad selection of parent trees for such stock is used to maintain genetic diversity. See Appendix 2-4 for a description of the tree improvement program.

Initial spacing of seedlings, thinning and control of competing vegetation would be planned to maximize wood production by concentrating site resources on individual tree growth except in Alternative C, in the connectivity areas, and in the OGEAs of the Preferred Alternative.

Target stocking levels cannot always be achieved by the initial planting. Post-treatment reforestation surveys would be conducted to determine the rate of survival and if replanting or interplanting would be required to meet stocking standards.

Plantation Protection

Treatments would include protection of seedlings from the sun by shading and protection from damage by deer, elk, mountain beaver or other animals by placing plastic tubing or netting over the seedlings or by bud capping. Large populations of mountain beaver or pocket gophers would be reduced by several different methods when they cause significant damage to a plantation. The number of acres requiring each of these treatments would be determined annually in conjunction with normal reforestation surveys. Control within progeny test sites and other intensive study plots would also include porcupine or other animals causing significant damage.

Plantation Maintenance and Release

Maintenance treatments promote the survival and establishment of coniferous seedlings. Release treatments reduce competition for light, moisture and nutrients between surrounding vegetation and existing coniferous seedlings, and promote dominance and growth of established coniferous trees.

Faster growing hardwoods, such as red alder, bigleaf maple or vine maple, overtop and suppress slower starting conifer seedlings. The degree and type of competition varies with the individual site. On dry sites, grasses, forbs and shrubs are strong competitors for water, while elsewhere shrubs and/or hardwoods grow rapidly enough to shut out essential light and compete for water during the dry summer. With reduced competition, the conifers rapidly grow beyond the point where they can be overtopped and further suppressed by surrounding vegetation. When this growth situation is achieved (approximately three to ten years after planting), there would be no further effort to control competing vegetation.

An integrated vegetation management approach would be used in selection of maintenance and release treatments, in conformance with BLM's "ROD, Western Oregon Program - Management of Competing Vegetation", 1992. Herbicides would be used to control competing vegetation when analysis shows their use to be the most appropriate treatment. See the previous discussion on site preparation for further discussion of herbicide use. Manual vegetation control methods (clearing around selected commercial trees using hand tools) would also be used when considered most appropriate to assure commercial tree growth.

Precommercial Thinning

Precommercial thinning would be applied to timber stands in the intensive timber production base that are overstocked. Thinning would generally be done between 10 and 20 years of age. Average number of trees left would vary between 150 to 250 trees per acre depending on the alternative and individual stand prescription. Higher densities would be left under Alternative A, lowest under Alternative C and the Preferred Alternative. Contract specifications will define desired density, spatial arrangement and selection criteria for trees to be retained.

Fertilization

Areas precommercially or commercially thinned and portions of areas where stocking control is achieved through plantation spacing would be fertilized where increased wood yields would result except under alternative C and the preferred alternative in connectivity areas and OGEAs. The average application is expected to be 200 pounds of nitrogen per acre beginning when the stand is precommercially thinned and at 15year intervals thereafter until 20-25 years before final harvest. In addition to acceleration of growth for up to 15years following treatment, fertilization tends to reduce shock associated with thinning.

Forest Tree Improvement

Top ranking plus trees will be managed intensively in the field to optimize cone production (thinning, fertilization, girdling and systemic insecticide treatment). The seed orchards for Douglas-fir and sugar pine will be managed to produce increasing yields of genetically selected seed. Minor species seed production plantations are also being planted in the seed orchards to ensure a dependable supply of seed for trees native to the Roseburg District.

Minor Forest Products

Extraction of minor forest products (firewood, shake bolts, ferns, floral greens, etc.) would be accommodated on lands available for such harvest, to the extent of product availability, funding to administer transactions, and consistency with plan objectives. Sales are normally made on a negotiated basis, with the permit or contract containing applicable stipulations for the protection of other resource values.

Access for Timber Management

Roseburg District BLM-administered lands and private lands generally are intermingled in the planning area, therefore, each party must cross the lands of the other in order to reach their timber. BLM policy would continue to provide all prospective purchasers of BLM timber with an equal opportunity of access when timber is offered for sale. This would most often be accomplished by reciprocal right-of-way agreements with private landowners or through federal ownership and control of roads. Reciprocal right-of-way agreements would continue to be used to identify conditions of use that are equitable and nondiscriminatory and facilitate management of the road network. Most of the lands where logging road right-of-way agreements are appropriate are now covered by reciprocal agreements. The 140 individual agreements and permits would continue to be subject to the regulations in effect when they were executed or assigned. The provisions of these agreements allow BLM only limited discretion to control the location of roads constructed by private parties across BLM-administered lands (and vice versa). This limited discretion allows BLM to object for only one environmental reason - excessive erosion damage. However, future reciprocal right-of-way agreements could have different provisions depending on the regulations in effect at the time of their execution.

When the landowner does not need rights to cross BLM-administered lands, BLM gains access through the purchase of either a nonexclusive or an exclusive road easement. Nonexclusive road easements are obtained for administrative and timber harvest purposes only.

Special Status Species Habitat (Including Threatened and Endangered Species)

Habitats of federally listed or proposed threatened or endangered species would be managed as required by law and consistent with approved recovery plans. Field or office reviews would be conducted on all proposed actions prior to any ground manipulation or any disposal of BLM-administered land. Effort would be made to modify, relocate, or abandon a proposed action to avoid a "may affect" determination if a federally listed or proposed species was located during project review. Consultation or conference with the U.S. Fish and Wildlife Service would be initiated on all "may affect" determinations. No actions would be undertaken or permitted that would jeopardize populations of federally listed or proposed species.

Systematic inventories and monitoring would be conducted for populations and distribution of special status species where baseline information is lacking. Habitat Management Plans (HMP) will be developed for special status species whenever significant long term management guidelines and programs are needed.

All actions would be consistent with the Pacific Bald Eagle Recovery Plan. To meet recovery plan goals, the currently existing six bald eagle nest territories and habitat (4,660 acres) would be protected as well as any future occupied territories under the following management guidelines:

1. Maintain or attain the following stand characteristics on all lands managed for bald eagles:
    a. Large conifer trees that are greater than 50 inches dbh and occur at a density of five to seven trees per acre.
    b. Multi-storied canopy with at least 60 percent crown closure.
    c. Remainder of the stand with conifer trees with an average dbh of 24 inches and an average density of 50 to 70 trees per acre.
2. Avoid disturbance including logging, mining and mineral leasing (except existing recreational use) within 1/2-mile of active nest sites which may adversely affect, between the dates of February 15 and August 31 contingent on consultation under Sec. 7 of ESA.
3. Provide an appropriate level of fire protection on lands managed for bald eagles and restrict the use of insecticides within 1/2-mile of bald eagle sites.

All actions would be consistent with the Pacific Peregrine Falcon Recovery Plan.

The integrity of potential Peregrine falcon nesting cliffs (Chimney Rock, Taylor Creek, Buck Butte, Callahan Ridge, and Hill Creek - 560 acres) on BLM-managed lands would be maintained.

Seasonal restrictions would be placed on all logging activities, road building, mining, and operating large equipment which may adversely affect within 1/4-mile of active northern spotted owl nest sites during the nesting and fledging season to avoid disturbance and harm to adult and young owls.

All actions would be consistent with the Columbian White-tailed Deer Recovery Plan.

Wildlife and Fish Habitat

Non-merchantable down-and-dead wood would be retained on areas allocated for timber production, to the extent compatible with reforestation objectives, fire hazard reduction standards, and watershed protection objectives. Gross yarding would be planned only where needed for one of these purposes. At a minimum, Forest Practices Act (OAR 629-24) standards for snags and down logs would be met. Salvage of down-and-dead wood on lands not allocated for timber production (lands outside the timber base) would be conducted only after adequate amounts of such material have been retained to provide habitat for maintenance of small animal populations and biological diversity.

Except where public safety is a concern, snags would be retained where they occur on lands not allocated to timber production and left as non-merchantable material in timber harvest units. Where relevant to meeting cavity nester objectives, and to the extent that funding permits, some green trees on lands not allocated to timber production would be girdled or topped to create snags. Timber sale contracts would require retention of all snags and non-merchantable trees that can be left safely in timber harvest areas. In alternatives providing for retention of wildlife trees that may be merchantable in timber harvest units, the following guidelines would be used:

- Leave all soft snags except where unacceptable for safety, logging systems, or control of prescribed burns or wildfire suppression purposes.
- Leave scattered hard snags and green trees, including culls, both to provide the current needs of hard-snag-dependent species, and to serve as a source of future snags. As a minimum, one conifer wildlife tree per acre on intensive forest management land base or three conifer wildlife trees per acre on lands withdrawn from the commercial timber base would be retained. The distribution of wildlife trees could be in a scattered or in a clumped pattern depending on the occurrence of suitable trees and harvest practices.

Wherever practical, new roads would avoid areas with high wildlife values. Temporary roads not needed for continued management would be closed upon completion of logging and replanting.

Special habitat areas such as lakes, talus slopes, meadows, serpentine barrens, and wetlands would be managed to protect their habitat values. Impacts from road construction would be permitted under all alternatives when construction outside a special habitat would result in greater impacts to other resources.

Forage seeding would be done, where compatible with continued timber production, following regeneration cuts in any Oregon Department of Fish and Wildlife designated wildlife unit where less than 30 percent of the land base is in the early seral stage.

Mineral materials would not be sold from riparian zones.

Demonstration/experimental watersheds would be designated in the three physiographic zones used by anadromous fish: Wolf Creek (T. 24 S., R. 7/8 W.), Stouts Creek (T. 30/31 S., R. 3 W.), and Pass Creek (T. 24 S., R. 1 W.). These watersheds would be used to collect baseline data, follow trends, monitor riparian, stream and fish parameters, and to apply new techniques or studies that would benefit from the availability of background data.

When practical, timber sale contracts would require removal of debris which obstructs fish passage or has the potential to degrade a stream channel. All other large woody debris and snags in and adjacent to fishery streams would be retained. Stream crossing structures would be installed so that fish passage is not impeded.

Stream enhancement projects would be implemented consistent with BLM's nationwide "Fish and Wildlife 2000 - A Vision for the Future" (USDI BLM 1989). All uncompleted fish habitat improvement projects identified in BLM's "A Five-Year Comprehensive Anadromous Fish Habitat Enhancement Plan for Oregon Coastal River", 1985, would be completed. In addition, a number of other potential projects have been identified where significant, correctable limiting factors exist. These projects may include full and partial stream spawning structures, rootwad and brush bundle placement, blast pools, bank stabilization, off-channel development, culvert access or replacement, riparian conversion to conifers, structure maintenance, and barrier removal. Table 2-2 shows both remaining projects in the Five-Year Plan and other proposed projects.

Existing and new water impoundments would be used to provide recreational fishing opportunities where sufficient water quality and quantity exist. All wildlife habitat management practices (i.e., plantings, seedings, nest boxes and structures, water developments, pond construction, stream structures, inventories) could be implemented under any of the alternatives, as long as compatible with other management objectives.

See the previous Water Quality and Riparian Areas discussion for riparian management direction which relates to wildlife and fish habitat.

Special Areas

Existing special areas which are selected for continued management would be managed in accordance with existing management guidelines. Management plans would be developed for new or modified special areas or for any existing special area where management objectives have been changed. Prescribed fire could be used to achieve management objectives. All RNAs would be designated as closed to off road vehicle (ORV) use.

All special areas designated in any alternative would be designated Areas of Critical Environmental Concern (ACEC). Some special areas would also be designated Research Natural Areas (RNA) in order to clarify management emphasis.

Recreation

Most BLM-administered lands in the planning area would be designated as Extensive Recreation Management Areas (ERMA). Consistent with BLM's nationwide Recreation 2000 plan, lands would be managed for a diversity of resources. The lands would be available for dispersed recreation activities, including hunting, fishing, sightseeing, riding, hiking, and rafting, consistent with managed forest settings. Provision of opportunities accessible by car and close to population centers would be emphasized. In general, BLM-administered lands would be open to recreational mineral collection (casual use) unless subject to prior rights, such as mining claims. The following existing recreation facilities and other Special Recreation Management Areas (SRMA) would be maintained and managed (some in partnership with other agencies or groups) as indicated:

- Recreation Sites - 91 existing campsites; 61 picnic units; two shelters.
- Trails - 13.5 miles, for hiking, horseback and other non-motorized use.
- SRMA - 1620 acres managed to facilitate recreational use and boat access to the North Umpqua River, with no existing boat ramps and one existing white water raft launch site.
- Susan Creek recreation site (200 acres) and the Recreational Gold Panning Area (94 acres) would be withdrawn from locatable entry and would have no surface occupancy for mineral leasing. (See Table 2-3)

Eighty-nine miles of roads would be dedicated as Backcountry Byways, a component of the National Scenic Byway System.

The use of off-road vehicles (ORV) on BLM-administered lands will be regulated in accordance with the authority and requirements of Executive Orders 11644 and 11989 and regulations contained in 43 CFR 8340. They require that ORV use not cause significant adverse impacts to resource values, that conflicts between visitors be minimized, that public hazards are identified, and that public safety is promoted.

Increasing emphasis would be placed on interpretive and informational signing and maps, to support state and local strategies for encouraging tourism. Increased emphasis would also be placed on accomplishing the goals and objectives of BLM's Recreation 2000 Implementation Plan and the Oregon-Washington Special Recreation Management Area and Extensive Recreation Management Area Initiatives.

Opportunities for new hiking trail construction would be pursued where such development does not conflict with other allocated uses.

Wild and Scenic Rivers

BLM-administered land adjacent to and within approximately 1/4-mile of the designated 8.4 mile (recreation) section of the North Umpqua Wild and Scenic River will be managed to protect, and to the extent possible, enhance the outstandingly remarkable values which resulted in the river's designation by Congress. No timber harvest would be planned as part of the sustained yield timber management program within the designated Wild and Scenic River corridor boundary. However, salvage of trees killed by a natural catastrophic event would be allowed. A specific management plan for this river segment will be developed to implement the requirements of the Wild and Scenic Rivers Act of 1968, as amended. Management guidelines and standards for national Wild and Scenic rivers are described in Appendix 2-8.

For rivers determined to be suitable through the planning process for designation under the Wild and Scenic Rivers Act, and all eligible rivers where suitability is not determined (generally, those segments where BLM administers less than 40 percent of the land within 1/4-mile), BLM's interim wild and scenic river management policy will remain in effect pending Congressional resolution of the designation issue. Under this interim management, no actions would be authorized on BLM-administered lands within 1/4-mile of the river that would adversely impact the outstandingly remarkable value(s) which resulted in the river being found eligible for designation for Wild and Scenic status.

For rivers suitable or found eligible (but not studied) for recreational status, interim management would exclude timber harvest on BLM-administered land in the riparian management area and protect the identified outstandingly remarkable values of the segment. No rivers have been found eligible for scenic or wild status classification.

The North Umpqua Wild and Scenic River Management Plan would be adopted as the land management document for those lands within the designated boundaries of the Wild and Scenic River Corridor.

Wilderness Study Areas

There are no lands in the planning area which are eligible as Wilderness Study Areas.

Visual Resources

Visual resource management (VRM) classes and objectives are set forth below:

> Class I. The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
>
> Class II. The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
>
> Class III. The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
>
> Class IV. The objective of this class is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance and repeating the basic elements.

Management approaches to meet VRM Class II objectives would employ single tree selection, uneven-aged harvest, retention of shelterwood overstory trees or group selection management in seen areas. Larger clearcuts would be in unseen areas. Fire suppression and fuels management standards would be established to meet VRM Class II objectives.

To permit screening of clearcuts and permit time for regrowth between sequential entries, clearcut harvests would not remove more than 6.6 percent of any seen VRM Class II area in a given decade.

Management approaches to meet VRM Class III objectives would employ either short-term retention of shelterwood overstory trees, or use of clearcuts which have less than ten acres of seen area and which do not disturb more than ten percent of the seen VRM Class III area in any decade. Where possible, clearcuts would be screened from key viewing points along major travel routes by uncut areas or by shelterwood units or young stands.

No specific visual management constraints would apply to lands managed for VRM Class IV objectives, but mitigation of visual impacts would be incorporated where consistent with efficient timber harvest or other management activities.

In the visually sensitive corridors along Interstate 5 and State Highways 38, 42 and 138, guidelines of the revised Oregon Forest Practices Act as spelled out in Section 17 will be followed as a minimum requirement.

Cultural and Paleontological Resources

BLM would continue to identify localities with cultural resource values and manage them for their public and scientific uses. This objective would largely be accomplished through implementation of 36 CFR 800, which ensures that authorized land use actions do not inadvertently harm or destroy federal or non-federal cultural resources, but would also include affirmative measures taken to protect and enhance cultural resources. The affirmative measures would be largely a result of the 1988 Archeological Resources Protection Act (ARPA) amendments and the Bureau initiative, Adventures in the Past. The ARPA amendments direct Federal agencies to identify and evaluate their cultural resources and to develop public awareness programs to explain the significance of those resources. Adventures in the Past helps attain those goals by enhancing public enjoyment and awareness of cultural resources. Implementation of these measures would depend upon adequate funding and would be susceptible to change based on the accumulation of new data. These measures would include:

- Systematic inventory of areas likely to contain cultural resources.
- Systematic testing and evaluation of archaeological sites to assess their potential for contributing to public and scientific uses.
- Development of cultural resource management plans for areas with fragile resources or a record of intensive prehistoric or historic use. These areas would include Golden Bar, the North Umpqua River corridor and Little River/Wolf Creek area, the Middle Creek drainage and Camas Valley, the White Rock/Deadman Mountain/Deadman Creek area, and the mining areas in the southern portion of the District.
- Development of inventory plans based on geomorphic provinces of the Coast Range, western Cascades, and Klamath Mountains.
- Acquisition of significant cultural resource properties for conservation and scientific purposes. These properties would include five sites located throughout the planning area: 35DO17, 35DO191, 35DO291, 35DO431, and 35DO383.
- Development of Memoranda of Understanding with relevant Indian groups so that their heritage and religious concerns may be appropriately considered. These groups would include the Cow Creek Band of Umpqua Tribe of Indians, the Confederated Tribes of Siletz Indians, the Confederated Tribes of Grand Ronde, and Coquille Indian Tribe, and the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians.
- Systematic monitoring by law enforcement personnel of cultural resources being impacted by unauthorized use such as 35DO147, 35DO153, and 35DO435.
- Interpretation of cultural resources to increase public awareness and appreciation of the resource values.
- Implementation of physical protection measures, such as riprapping and barrier installations, to reduce deterioration.

All vertebrate fossils and scientifically significant invertebrate and plant specimens will be collectible only under a permit issued by an authorized officer. Common fossils will be collectible without a permit as long as mechanized equipment or explosives are not used. Paleontological clearances will be performed as a standard part of project clearance. Affected sites will be analyzed for their significance and mitigation measures will be applied if appropriate. Efforts to increase our knowledge of sites and specimens will continue, using volunteers or contractors as appropriate. The locality of the Days Creek mammoth discovery will be monitored for additional exposures.

Land Tenure

Exchanges and acquisitions will be made to enhance public resource values and/or improve land patterns and management capabilities of both private and BLM-administered lands within the planning area by consolidating ownership and reducing the potential for land use conflict. These would occur when opportunities arise that enable the BLM to meet the goals for an alternative. For this reason, exchanges and acquisitions are not quantified in this document.

All land tenure adjustments will consider the effect on the mineral estate. If the lands are not known to have mineral potential, the mineral interest will normally be transferred simultaneously with the surface.

The land ownership adjustment criteria identified in Appendix 2-5 will be considered in environmental assessments prepared for specific adjustment proposals.

Transfer of lands to other public agencies will be considered where consistent with public land management policy and where improved management efficiency would result. Minor adjustments involving sales or exchanges may be made based on site specific application of the land ownership adjustment criteria.

Land to be acquired by the BLM through exchanges or any other method, generally must:

- facilitate access to public land and resources, or
- maintain or enhance important public values and uses, or

- maintain or enhance local social and economic values in public ownership, or
- facilitate implementation of other aspects of the approved Resource Management Plan.

Land tenure adjustment would be guided by a three-zone concept utilizing the following standards:

- Zone 1 includes areas currently identified as having high public resource values, and other efficiently managed lands. The natural resource values may require protection by Federal law, Executive Order or policy. These lands may have other values or natural systems which merit long-term public ownership. They do not meet the criteria for sale under the Federal Land Policy Management Act of 1976 (FLPMA) Section 203(a) and would generally be retained in public ownership.
- Zone 2 includes lands that meet criteria for exchange because they form discontinuous ownership patterns, are relatively inefficient to manage, and may not be accessible to the general public. These BLM-administered lands may be blocked up in exchange for other lands in Zones 1 or 2, transferred to other public agencies, or given some form of cooperative management. These lands would not be sold under FLPMA Section 203(a).
- Zone 3 includes lands that are scattered and isolated with no known unique natural resource values. Zone 3 lands would be available for use in exchanges for private in holdings in Zone 1 (high priority) or Zone 2 (moderate priority). They are also potentially suitable for disposal through sale under FLPMA Section 203(a) if important recreation, wildlife, watershed, threatened or endangered species habitat and/or cultural values are not identified during disposal clearance reviews and no viable exchange proposals for them can be identified. Zone 3 lands would also be available for transfer to another agency or to local governments, as needed to accommodate community expansion and other public purposes.

Land exchanges conducted under the zone concept will be made to benefit one or more of the resources. Exchanges will be consummated when it is determined that the public interest will be served by making the exchange. Exchanges will be conducted under the authority of FLPMA Section 205 and 206 (Public Law 94-579).

Lands in the zones would be the same in all alternatives as shown on Map2-1. Zone 3 lands are listed in Appendix 2-6.

Sales of BLM-administered lands are conducted under the authority of FLPMA Section 203(a) which requires that one of the following criteria exist before land is offered for sale:

1. Such tract, because of its location or other characteristics, is difficult or uneconomical to manage as part of the BLM-administered lands and is not suitable for management by another Federal department or agency; or
2. Such tract was acquired for a specific purpose and the tract is no longer required for that or any other Federal purpose; or
3. Disposal of such tract will serve important BLM-administered objectives, including but not limited to, expansion of communities and economic development, which cannot be achieved prudently or feasibly on land other than BLM-administered land and which outweigh other public objectives and values, including, but not limited to, recreation and scenic values, which would be served by maintaining such tract in Federal ownership.

In addition to the sale criteria listed above, where O&C or CBWR lands are involved there must also be a determination as to whether the lands are more suitable for management and administration for permanent forest production and other purposes as provided in the Acts. When the lands are suitable for administration under the Acts they cannot be sold. State and local governments will be consulted prior to any land disposal.

Where survey hiatuses and unintentional encroachments on public lands are discovered in the future which meet the disposal criteria the lands may be automatically assigned to Zone 3 for disposal.

Non-federal lands that BLM is specifically considering for acquisition are located throughout the district. Land acquisitions are discussed in this chapter under the sections for Land Tenure Management, Cultural and Paleontological Resources, Wild and Scenic Rivers, and Access. The lands or interest in lands may be acquired through exchange, donation, or purchase.

Specific acquisitions common to all alternatives include:

1. The Cultural and Paleontological Resources section identifies sites that total 140 acres.

2. A total of 169 easements have been identified to access all parcels in the planning area for resource management. All 169 easements would not be acquired during the life of this plan. Easements would be acquired through the negotation or condemnation process.

3. The North Umpqua Wild and Scenic River Management Plan identifies specific tracts of private land which would be desirable to acquire.

Land Use Authorizations

Lease serial numbers ORe 05564, ORe 010734, OR 16775, OR 37065 and OR 37070, would be continued in accordance with the terms of each lease. A life estate residential lease (ORe 05564) would not be assigned at the end of its terms. Douglas County maintains Richard Baker County Park as a day use area. This 7.5 acre Recreation and Public Purpose (R&PP) lease, located within the Wild and Scenic River Corridor of the North Umpqua River, would be continued.

Temporary use permits, as identified under FLPMA section 302, would be issued for a variety of uses such as, but not limited to apiary, stockpile and storage sites, and as a tool to authorize unintentional trespass situations pending final resolution.

No leases or permits would be issued for landfills or other waste disposal facilities and no leases would be issued for new residential construction. Leases or permits for other uses of public land or amendments to existing authorizations would be authorized if the use does not conflict with higher resource values.

Rights-of-Way

BLM-administered lands would continue to be available for needed rights-of-way where consistent with local comprehensive plans and Oregon's statewide planning goals and rules. The occupied utility transportation routes identified in the Western Regional Corridor Study, 1986, containing electrical transmission facilities of 115 to 500 kV and pipelines ten inches in diameter or larger, would be designated as corridors under this plan. These corridors would be available for uses compatible with existing facilities. The corridors described above and all existing communication sites are shown on Map 3-1.

Corridor widths vary depending on the number of parallel facilities, but are a minimum of 2,000 feet (1,000 feet either side of existing centerlines) unless constrained by exclusion and avoidance areas described below. Applicants would be encouraged to locate new facilities (including communication sites) adjacent to existing facilities to the extent technically and economically feasible.

No Federal or State highways, major county roads, railroads, or interstate communication lines would be designated as corridors because topographic constraints have limited most development to non-federal lands. No public lands have been identified as short critical segments or corridor windows for these land uses, or for microwave communication sites. There are no significant canals, ditches, or conduits located within the planning area.

Communication facilities would be allowed on existing communication sites. Existing communication sites would be fully developed with compatible uses prior to developing new sites. New communication sites would be considered available for development when the use is consistent with the objective of the alternative.

Prior to BLM approval of a right-of-way, the applicant must submit plans, maps, and other information related to the use of the proposal, for evaluation. Each right-of-way would be limited to the area necessary for operation and maintenance. Approvals would consider the protection of public safety, be consistent with the RMP, and minimize damage to the environment.

All Research Natural Areas and VRM Class I areas would be considered right-of-way exclusion areas where future rights-of-way may be granted only when mandated by law.

All existing and proposed recreation sites, ACECs other than research natural areas, (rivers suitable for scenic status), and areas identified as having threatened or endangered, proposed, candidate (Category 1 or 2), state listed, or Bureau sensitive plant or animal species would be avoidance areas (where future rights-of-way may be granted only when no feasible alternative route or designated right-of-way corridor is available). Areas identified for VRM Class II management would be avoided or appropriate mitigation measures taken. On August 10, 1988, the Northwest Power Planning Council ammended its Northwest Conservation and Electric Power plan to prohibit future hydroelectric development on rivers and streams with significant fisheries and wildlife resource values. In accordance with the plan, rights-of-way authorizing new hydroelectric development would not be approved on the streams designated in the plan. For lands acquired in the future, hydroelectric development would not be allowed on any rivers or streams designated as protected in the Northwest Conservation and Electric Power Plan.

Access

The BLM acquires access to its lands by the purchase of road easements and by entering into reciprocal right-of-way agreements. Road easements for administrative and timber harvest purposes would be acquired where needed to support timber management or other programs. When acquiring easements, an attempt would be made to also negotiate public access rights. Condemnation for access may be pursued where negotations fail. Where opportunities arise to negotiate such rights, in conjunction with existing reciprocal right-of-way agreements, that also would be attempted. Acquisition of an additional 169 easements would be required for access to all parcels in the planning area for resource management.

Withdrawals and Land Classifications

Withdrawals generally segregate the lands from operations under the non-discretionary general land laws, mining laws and sometimes the mineral leasing laws. All withdrawals remaining to be reviewed are identified in Appendix 3-1. These withdrawals will be reviewed during the 1990's and may be continued, modified, or terminated. The BLM currently manages lands withdrawn as Power Site Reserves, Power Site Classifications, and Water Power Designations. These lands will be managed in accordance with the objectives of the plan whether the withdrawals are continued, modified, or terminated.

Two new public land and mineral law withdrawals are being considered in the Recreation section of this chapter (refer to Recreation Table 2-3). They will not be withdrawn from the mineral leasing laws, but will have a no surface occupancy stipulation applied to any leases that may include those areas.

It is expected that new proposals for acquisition and/or development of special concern areas (e.g. recreation sites, ACEC/RMA) will arise over the next decade. Whenever existing regulations are not adequate to guarantee protection of improvements or resources, or whenever additional lands are acquired to enlarge the size of existing special concern areas, a withdrawal that would be consistent with the management objectives would be considered.

Classifications would generally withdraw land from the operation of general land laws and mining laws, but not mineral leasing laws. Classifications recommended for termination are listed in Table 2-3. These include three Small Tract Act and one Recreation and Public Purpose Act classification. Once revoked, the lands would be restored to the operation of general land and mining laws. Since the lands involved are being managed for purposes established through the classification process, but under different authorities, no change in land use is anticipated. New classifications for Recreation and Public Purpose Act (R&PP) leases would be considered in land tenure Zone 2 for all new proposals that surface during the life of this plan. A ten acre tract located in Lot 1, Section 28, T. 24 S., R. 7 W. would be classified for R&PP lease purposes for a boat ramp facility on the Umpqua River.

Energy and Minerals

Leasable Minerals

Standard oil and gas lease stipulations are listed in Section 6 of “Offer to Lease and Lease for Oil and Gas” Form 3100-11. They are displayed in Appendix 2-7.

Special stipulations (See Appendix 2-7) would be attached to oil and gas leases to provide additional protection for fragile areas or critical resource values. The special stipulations are seasonal restrictions for critical wildlife habitat, and a ban on surface occupancy, to protect special values or fragile areas. The stipulation prohibiting surface occupancy can be waived by authorized BLM officials; exceptions would be considered on a case by case basis.

Any proposed drilling pad or road construction would be located to avoid steep slopes and areas of highly erosive soils. Surface disturbance would have to be restored to original contours when operations were completed. Activities could not dominate the landscape or leave long-term visual impacts. The evidence of exploration or development activities should be substantially unnoticeable after reclamation has been completed.

Locatable Minerals

Areas not specifically withdrawn from mineral entry would continue to be open under the mining laws. Mineral exploration and development will be regulated under the Surface Management Regulations 43 CFR 3809 to prevent “unnecessary or undue degradation”. All surface disturbance from operations, whether conducted under casual use, a notice, or an approved plan of operations, shall be reclaimed. The standards that govern activities conducted under a notice affecting five acres or less and those that govern activities conducted under a plan of operations are also shown in Appendix 2-7. Minimum reclaimation standards shall be in accordance with BLM Manual and Supplemental Guidance.

Salable Minerals

Salable minerals, including common varieties of sand, gravel, rock and stone, would be made available for local governments, if demand exists, consistent with management direction for protection of other resources, and consistent with the requirement that undue degradation be prevented. These needs and any private demand would be met from existing designated community pits where they provide practical sources of material. New pit or quarry sites would be opened where appropriate. Specific sites may be closed or reclaimed.

Rock quarries would also continue to be used to provide rock for use in construction and maintenance of BLM timber access roads. New quarry sites would be developed as needed, if they are consistent with the management direction for protection of other resources, with provision for reclamation following use.

Reserved Federal Mineral Estate

The reserved federal mineral estate would continue to be open for mineral development. Conveyances of mineral interest owned by the United States, where the surface is, or will be, in non-federal ownership, may be made to the existing or proposed owner of the surface estate after a determination is made under Section 209(b) of FLPMA, finding:

- That there are no known mineral values in the land, or
- That the reservation of mineral rights in the United States would interfere with or preclude non-mineral development of the land and that such development is a more beneficial use of the land than mineral development.

Roads

Roads would be constructed and maintained to standards sufficient to serve their anticipated use. Road construction would be sited and scheduled so as to avoid mass movement of soil. Permanent roads would be paved or rocked to minimize sedimentation. Cuts and fills of new roads capable of supporting vegetation would be seeded to stabilize them prior to winter rains to provide the maximum possible stability. Roads built for temporary use would be stabilized prior to winter rains and rehabilitated when use is completed. Roads would be closed, if required, to prevent or alleviate significant resource damage. Road closures would be implemented using standard analysis, public involvement, and notification procedures.

Noxious Weeds

Treatment of noxious weeds to control infestations on BLM-administered lands would be accomplished using an integrated pest management approach. Chemical, mechanical, and biological methods would be considered. Application and monitoring of the effects of herbicides would be done in accordance with BLM's multi-state" EIS, Northwest Area Noxious Weed Control Program", 1986, as supplemented in 1987, and the related Record of Decision (ROD). (See Appendix 1-3 for relevant portions of the ROD.)

Hazardous Materials

The transportation, storage, and handling of hazardous materials (anything that poses a substantive present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed), will be in accordance with manufacturers' specifications and applicable laws such as the Resource Conservation and Recovery Act, Emergency Planning and Community Right-to-Know Act and other environmental laws.

Any release, unauthorized dumping, or abandoned or inactive waste disposal site suspected of involving hazardous wastes will be reported, assessed, and treated in accord with the district's Hazardous Materials Contingency Plan, the Federal Water Pollution Control Act, the Clean Air Act, the Comprehensive Environmental Response, Compensation and Liability Act, and other applicable state and federal environmental laws.

Fire

All BLM prescribed fire activities which affect air quality would be conducted in accordance with the Oregon State Implementation Plan (ODEQ 1981), administered by the Department of Environmental Quality, and the Oregon Smoke Management Plan (ODF 1972), administered by the Department of Forestry. The protection of public land from the impacts of widlfires and the planned application of prescribed fire to meet various resource management objectives would be implemented as part of all alternatives on BLM-administered land within the planning area.

Wildfire

Fire protection and the use of fire will be implemented on BLM-administered lands under all alternatives. BLM resources would be aggressively protected from damage due to wild fire in accordance with the least suppression cost plus the most beneficial net change in resource value (total cost = suppression cost + net value change). This includes the cost of emergency rehabilitation after wildfire.

The management of wildfires on BLM-administered lands in the planning area is accomplished through contract with the Oregon Department of Forestry (ODF). ODF has assigned the responsibility for protection of the Roseburg District BLM-administered lands to the Douglas Forest Protective Association. The primary objective of the contract is prompt detection, attack and suppression of all wildfires in accordance with the Roseburg District's resource management objectives. The district provides suppression resources to the ODF on a cost reimbursable basis for any fires which threaten or occur on BLM-administered land in the planning area. The district also maintains qualified resources and personnel for regional and national wildfire suppression by other agencies.

The suppression of wildfires under all alternatives would involve either an Intensive or Conditional response, depending upon the resource values at risk. Regardless of which of these two response levels is followed, a BLM Environmental Specialist with specific knowledge of resource values, locations and constraints would be assigned to all wildfires that escape initial attack.

Intensive fire suppression would be required where unacceptable resources damage would occur from a wildfire of any intensity. Conditional suppression would be required where the intensity of the suppression action can vary based on the environmental and operational conditions.

The identification of special suppression levels (i.e., intensive and conditional) by the resource management area would determine the intensity of the suppression action required. Suppression levels would meet the resource management objectives for the management area emphasis (i.e., wildlife, recreation, range, and timber). Therefore, depending on values at risk (soil, air quality, timber, fisheries, Special Habitat Areas, etc.), various suppression tactics would be used to minimize resource damage. Conditional tactics may exclude the use of bulldozers on fragile soils, ponding of important streams, soil disturbance near archaeological sites, backfiring near habitats of special status plants, etc. Conversely, certain areas such as developed recreation areas, new plantations, or advanced regeneration sites have very high resource value which may dictate the use of air tankers and other expensive intensive suppression tactics for maximum protection.

Emergency fire rehabilitation is frequently necessary following large, severe wildfires to prevent further site degradation and to restore the burned area to full productivity. Rehabilitation would be used to remedy adverse conditions caused by both the wildfire and the suppression activities. Rehabilitation may include restoration and seeding of bulldozer lines, prompt revegetation of bare areas on erodible soils, clearing ponded streams, etc.

Fire suppression tactics that reflect either intensive or conditional strategies for VRM, Special Areas, RNAs, ACECs, Wild and Scenic Rivers, and Rural Interface would be identified in site specific fire management plans.

Fuels Management

Fire hazard created by human activity or natural disturbances would be managed consistant with resource values through the use of the appropriate fuels management techniques (i.e., prescribed fire, mechanical treatments, and fuel breaks.)

Prescribed fire and other fuels management practices and techniques would be used, when biologically appropriate, to enhance, maintain, and protect resources. Such resouces include riparian zones, wildlife habitat, plant communities, special areas, unique ecosystems, etc.

Management Direction by Alternative

Goals and objectives for each alternative are defined in Appendices 1-5 and 2-15. Table 2-1 summarizes the management actions for each alternative. Key allocations for each alternative, except the No Action alternative, are displayed on fold-out maps enclosed with this document. These maps are digital (from computerized data). This data was compiled from BLM's most recent inventories. The No Action alternative, based on earlier inventories that were not computerized, could not be digitally mapped.

The specific direction for each alternative follows.

No Action Alternative

This alternative projects all land allocations and management actions in the existing plans for the next ten years. Some allocations have changed as a result of land tenure adjustments.

Water Quality and Riparian Areas

Soil and water resources would be conserved by meeting or exceeding Oregon Forest Practices rules during intensive timber management and by land allocations for riparian zones (18,300 acres of CFL withdrawn) and TPCC withdrawals (10,900 acres of CFL withdrawn). Riparian zones would be protected on third order and larger streams. Road and yarding corridors will be allowed in these zones.

Old-Growth and Mature Forest

Harvest would be limited in the first decade on 35,900 acres to temporarily protect older forests (in addition to that already withdrawn for other purposes). This system would provide for some harvest while protecting resources in mid-age and old-growth timber managed under a 250 year minimum harvest age. Included are functioning old-growth systems distributed by seed zone and elevation in order to safeguard long term timber production.

Timber

There would be 331,600 acres available for intensive timber production, and 35,900 acres for constrained timber production The allowable annual timber sale quantity for the expected 10-year life of the plan would be 39.5 mmcf (240.4 MMBF Scribner short log). An additional average annual 1.0 mmcf (6.3 MMBF) would be harvested from the constrained base.

Special Status Species Habitat

Threatened or endangered species would receive special attention under the terms of the Endangered Species Act of 1973. Because of their habitat requirements and locations, no impacts are expected to occur to the Columbian white-tailed deer and the bald eagle. To protect known bald eagle nesting sites, 350 acres of commercial forest land would be withdrawn and designated an ACEC. If a project may affect any federally listed or proposed threatened or endangered species or its critical habitat, the project would be modified or abandoned in order to obtain a no effect determination. If a project cannot be altered or abandoned, consultation with the U.S. Fish and Wildlife Service would be initiated. Other special status species would be protected to varying degrees on all BLM-administered lands. (See Table 2-1).

Other Wildlife Habitat

Non-hazardous snags would be retained on harvest units. Clearcuts would be spatially distributed.

Special Areas

Nine existing Special Areas would be retained, including three ACECs, two ACEC/RNAs, two RNAs, one ONA and one EEA. Total allocation would be 2553 acres. (See Table 2-5)

Recreation

All existing recreation sites and trails, including those identified in Management Common to All Alternatives, would be maintained and managed. See Table 2-3 for comparison of maintained sites and trails. Areas currently closed to ORV use will continue to be closed. Six recreation sites totaling 549 acres have been identified for withdrawal from public land and mineral law.

Wild and Scenic Rivers

The North Umpqua Wild and Scenic River plan will be implemented. No additional rivers would be recommended for federal designation as Wild and Scenic.

Visual Resources

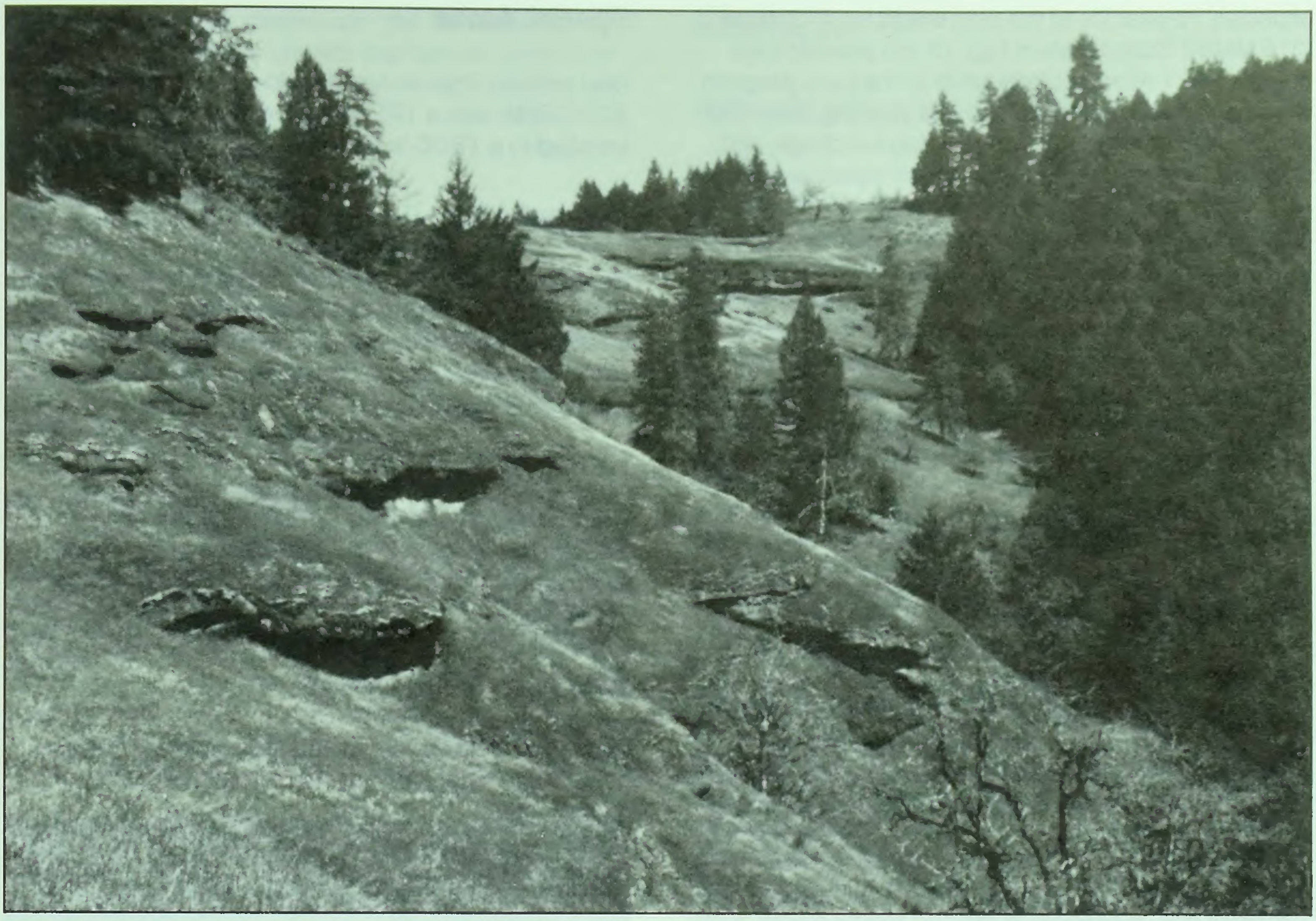
Along major travel routes that have been designated by the State of Oregon as scenic areas, approximately 9,300 acres will be managed to meet VRM II standards. See Table 2-1 for acres of each class by alternative.

Land Tenure

Lands identified as available for disposal by exchange or sale include approximately 286 acres of public domain and 649 acres of O&C lands. Another 137 acres of public domain lands has been identified for disposal by sale only.

Energy and Minerals

The majority of the mineral estate administered by the BLM would continue to be available for leasable minerals, open to location under mining laws and open to sale of salable minerals. Withdrawals totaling 1,262 acres would be proposed under this alternative for ACEC/RNAs and recreation sites. See Tables 2-5 and 2-3. See Tables 2-7, 2-8 and 2-9 for comparison of mineral restrictions by alternative.



Dickerson Rocks.
Photo by Russ Holmes

Alternative A

Water Quality and Riparian Areas

Riparian Management Areas (RMA) would be established averaging 75 feet horizontal distance (50 ft. minimum) in width on each side of perennial (generally 3rd order and larger) streams and other waters (e.g., lakes). Actual RMA widths would be determined by on-the-ground riparian vegetation, terrain and stream characteristics. See Table 2-1.

Old-Growth and Mature Forest

Forest lands in the TPCC category of Non-suitable Woodland would not be available for planned harvest. Other forest lands allocated for Riparian Management Areas, existing recreation sites, the North Umpqua Wild and Scenic River Corridor, and the bald eagle recovery plan would also not be available for planned harvest. These forest lands total 37,700 acres, of which 13,400 acres currently are old-growth and 9,600 acres are mature forest.

Timber

Of 393,500 acres of commercial forest lands, 371,200 (94.3 percent) were identified as suitable for timber production. These lands are considered capable of being reforested within five years after harvest and of being managed without irreversible resource damage. In this alternative, 353,300 acres would be available for intensive timber production. See Tables 2-1 and Figure 2-2 for comparisons of acres available for timber production.

Projected 10-year acres for timber harvest and other timber management activities are shown in Table 2-1. The allowable annual timber sale quantity for the expected 10-year life of the plan would be 47.7 mmcf (315 MMBF Scribner short log). Of the planned sale quantity, 46.1 mmcf is attributable to the base program which includes site preparation and planting, including genetically improved stock, protecting seedlings, and plantation release. The balance of 1.2 mmcf is attributable to intensive management practices (fertilization, precommercial thinning, commercial thinning, and brush and hardwood conversion). This 47.7 mmcf level is not the full biological potential of all the BLM-administered forest lands in the planning area. If all such forest lands were made available for timber harvest, and funds for environmentally sensitive timber harvest and reforestation were unlimited, the sustainable harvest could be as much as 50.6 mmcf.

Special Status Species Habitat

Management would be designed to protect habitat of federal candidate, state listed, and Bureau Sensitive species where such actions would not diminish commercial use. A field or office review would be conducted on all proposed actions. Mitigating measures that would not reduce commercial use would be implemented to protect special status species and their habitats. Current acres protected for plants are shown on Table 2-6.

Peregrine Falcon Habitat

At present there are no known Peregrine falcon nesting sites on district BLM-administered lands. Peregrine falcon nesting cliffs occupied in the future would have seasonal disturbance restrictions within 1/2-mile placed around them including mining and mineral leases. Occupied sites would be protected to maintain features important to peregrines. Pesticides which have a negative effect on prey species or their habitat would not be applied within two miles of active sites. Habitat management plans (HMP) would be written for all active Peregrine falcon sites.

Other Wildlife Habitat

Special habitat areas would be managed to protect their plant and animal community structure, species composition, and ecological processes. Water courses flowing into and out of wetland habitats would be maintained. Emphasis for animals would be placed on identifying and protecting habitat values for bats, reptiles, and amphibians which are often associated with unique habitats such as caves, talus, and wetland/bog areas.

Special Areas

One existing Special Area would be designated an ACEC/RNA with a 170 acre allocation which would be included in a TPCC withdrawal.

Recreation

No existing recreation sites and trails would be closed. See Table 2-7 for comparison of maintained sites and trails. Areas currently closed to ORV use would continue to be closed. No additional areas would be closed to ORV use.

Two recreation sites (Susan Creek, which includes North Umpqua Trail Primitive Campsite and Susan Creek Campground Trail and Recreational Gold Panning Area) totaling 294 acres have been identified for withdrawal from public land and mineral law. See Table 2-3.

Wild and Scenic Rivers

No rivers would be recommended suitable for federal designation as part of the National Wild and Scenic rivers system.

Visual Resources

Forest lands allocated for timber production would be managed as VRM Class IV, and the remaining lands would be managed as inventoried. See Management Direction Common to All Alternatives, Visual Resource Management for VRM objectives and class standards by class. See Table 2-1 for acres of each class by alternative.

Land Tenure

Exchanges or acquisitions would be made to acquire lands which would enhance the non-declining harvest level of the commercial forest land managed by BLM. Factors to be considered include site quality, access to public forest land, logical logging units, and management of public forest land to facilitate timber harvest. No exchanges would be made to acquire lands for non-timber uses except those identified in the North Umpqua Wild and Scenic River Plan. No commercial timberland would be sold or leased. Leases or conveyances of land in Zones 2 and 3 other than commercial timberland would be made under the Recreation and Public Purposes Act to provide appropriate facilities or services.

Energy and Minerals

The majority of the mineral estate administered by the BLM would continue to be available for leasable minerals, open to location under mining laws and open to sale of salable minerals. Withdrawals totaling 464 acres would be proposed under this alternative for ACEC/RNAs and recreation sites. See Tables 2-5 and 2-3. See Tables 2-7, 2-8, and 2-9 for comparison of mineral restrictions by alternative.

Rural Interface Areas

No special timber management actions or mitigating measures would be provided in rural interface areas. Potential mineral development would be minimally constrained.

Douglas-fir.

Alternative B

Water Quality and Riparian Areas

Riparian Management Areas would be established with the following expected average widths (horizontal distance) on each side of perennial streams and other waters with a 50 foot minimum: 3rd order streams 75 feet, 4th order 100 feet, 5th order 140 feet, 6th order and larger 160 feet, other waters (e.g., lakes) 100 feet. RMAs would also be established on perennial 2nd order streams to protect important beneficial uses. Actual RMA widths would be determined by on the ground riparian vegetation and stream characteristics (Table 2-1).

Attempts would be made to obtain long term (e.g. 50 years) Natural Resource Easements on third order and larger streams in the experimental/demonstration watersheds.

Old-Growth and Mature Forest

Forest lands in the TPCC categories of Non-suitable Woodland and Suitable Woodland-Low Site would not be available for planned harvest. Other forest lands allocated for Riparian Management Areas, recreation sites, threatened and endangered species recovery areas where timber harvest is prohibited, and ACECs would also not be available for planned harvest. These forest lands total 46,800 acres, of which 15,900 acres currently are old-growth and 11,200 acres are mature.

An additional 24,700 acres of forest land would be excluded from planned harvest of which 15,000 acres are currently old-growth and 5,300 acres are mature. These lands are aggregated in blocks of approximately 640 and 80 acres distributed in a corridor system by seed zone and elevation. Some of the blocks incorporate lands excluded from harvest for other purposes as noted in the preceding paragraph. Public domain lands received priority for placement in the corridor system. These blocks are labled “seral stage blocks” on the alternative B map.

Timber

There would be 318,900 acres available for intensive timber production, and 2,400 acres for restricted timber production. See Tables 2-1. Projected 10-year acres for timber harvest and other timber management activities are shown in Table 2-1. The allowable annual timber sale quantity for the expected 10-year life of the plan would be 44.0 mmcf (291 MMBF Scribner short log).

Special Status Species Habitat

Management would be designed on O&C and CBWR lands to protect federal candidate, state listed, and Bureau sensitive species and their habitats when such actions would not diminish commercial use.

All special status species would be protected on public domain land. When it is considered biologically appropriate, special status species habitat on public domain lands would be buffered by 300 feet from all surface disturbance and harvest of timber. Federal candidate species known only to occur on BLM-administered lands would be protected to the extent necessary to prevent their federal listing. A field or office review would be conducted on all proposed actions. Other special status species would be protected to varying degrees on all BLM-administered lands. See Table 2-1.

Peregrine Faclon Habitat

At present there are no known Peregrine falcon nesting sites on district BLM-administered lands. Peregrine falcon nesting cliffs occupied in the future would have seasonal disturbance restrictions within 1/2-mile placed around them including mining and mineral leases. Occupied sites would be protected to maintain features important to peregrines. Pesticides which have a negative effect on prey species or their habitat would not be applied within two miles of active sites. Habitat management plans (HMP) would be written for all active Peregrine falcon sites.

Bald Eagle

The Umpqua River Corridor Habitat Management Plan for bald eagles would continue to be in effect and implemented on 3,350 acres.

Other Wildlife Habitat

Wildlife Tree and Down Log

An average of two unmerchantable conifer wildlife trees per acre would be retained on the intensive forest managed land base, and three conifer wildlife trees per acre on all other lands. Wildlife trees would not necessarily be evenly distributed across harvest units. Wildlife trees would have a minimum diameter of 20 inches dbh and a minimum height of 50 feet whenever available. An average of two down logs with a diameter of at least 20 inches and 16 feet long per acre will be retained, where available, on all lands.

Special Habitat Areas

Special habitat areas would be managed to protect their plant and animal community structure, species composition, and ecological processes. Water courses flowing into and out of wetland habitats would be maintained. Emphasis for animals would be placed on identifying and protecting habitat values for bats, reptiles, and amphibians which are and often associated with unique habitats such as caves, talus, and wetland/bog areas.

Roosevelt Elk Habitat

Precommercial thinning projects would provide for maintenance of existing game trails free of slash accumulation that impede big game movement.

Management of elk habitat would be emphasized in the Tyee and Camp Creek elk management areas. The following guidelines would be adopted for timber harvest units:

1. Thirty percent of the harvest units would be small units (15 to 20 acres) with irregular boundaries.
2. Within harvest units the distance to cover would not exceed 500 feet.
3. Minimum width of cover adjacent to harvest units would be 200 feet.

Road management within the Tyee and Camp Creek elk management areas would be guided by a goal to limit the amount of habitat available to vehicle access and the increased disturbance and poaching which can occur with such access. Disturbance from vehicle access would be limited by:

1. Implementing year long road closures on approximately 20 miles of existing roads.
2. Newly constructed roads would be managed to limit open road densities to 1.5 to 2.5 miles of road per square mile on BLM-administered lands wherever practical.

Special Areas

Seven existing Special Areas would be retained, one of these existing Special Area would be expanded. One new Special Area would be designated. Three of these would be ACECs. The remaining five would be ACEC/RNAs. Total allocation would be 3,246 acres. (See Table 2-5.)

Recreation

All existing (including currently closed) recreation sites and trails, in addition to those identified in Management Common to All Alternatives, would be maintained and managed. See Table 2-3 for comparison of maintained sites and trails. To retain options for future development of high value potential recreation sites, no timber sales other than salvage sales of dead and dying timber would be made on 65 acres encompassing the following potential sites on public domain lands:

1. Umpqua Boat Launch
2. Hardscrabble Recreation Site
3. Iron Mountain Gold Panning Area

To develop the Hardscrabble recreation site, land acquistion would be pursued. This would involve acquiring aproximately 40 acres in two different ownerships located in Section 12, T. 22 S., R. 6 W., WM. Three recreation sites totaling 344 acres would be proposed for withdrawal from public land and mineral law. Areas currently closed to ORV use will continue to be closed. In addition, 3,246 acres of lands in designated ACECs would also be closed to ORV use.

Wild and Scenic Rivers

No additional rivers would be recommended suitable for federal designation as part of the National Wild and Scenic system.

Visual Resource

Available forest land adjacent to (within 1/4-mile) developed recreation sites, state and federal highways, state scenic waterways, and rivers designated under the federal Wild and Scenic Rivers Act would be managed as inventoried. All other available forest land would be managed as VRM Class IV, except as noted under Rural Interface Area Management. The remaining lands (non-forest, non-suitable woodland, suitable woodland - low site, and lands allocated for uses other than timber production) would be managed as inventoried. See Table 2-1 for acres of each class by alternative.

Land Tenure

Exchanges of O&C and CBWR lands would be made primarily to acquire lands which would enhance timber management opportunities. Exchanges of public domain lands would be made to benefit one or more of the resources managed, including non-timber values. Sale of O&C and CBWR lands other than available commercial forest lands, and of public domain lands, would be made to dispose of lands that meet any of the criteria of FLPMA Section 203(a). Leases of such lands would be made to accommodate other uses. Leases or conveyances under the Recreation and Public Purposes Act would be made in Zones 2 and 3 to provide appropriate facilities or services. Areas proposed for acquisition or withdrawal from the general land law and mining laws are identified in the Recreation section of this alternative. See Recreation Table 2-3. Easement acquisitions are discussed in the Water Quality and Riparian Areas section of this alternative.

Energy and Minerals

The majority of the mineral estate administered by the BLM would continue to be available for leasable minerals, open to location under mining laws, and open to sale of salable minerals. Withdrawals totaling 1,750 acres would be proposed under this alternative for ACEC/RNAs and recreation sites. See Table 2-5 and 2-3. See Tables 2-7, 2-8, and 2-9 for comparison of mineral restrictions by alternative.

Rural Interface Area

There are 8,552 acres of BLM-administered lands within 1/4-mile of private land in identified rural interface areas zoned for occupancy of one to five acre lots which would be managed for VRM Class III objectives. Alternative timber management practices would be applied, where appropriate, on those lands where it is feasible and consistent with sustained yield timber management to mitigate the adjacent neighbors concerns and for safety reasons. Examples of management options include harvest regimes other than clearcutting, hand application rather than aerial application of herbicides and pesticides, inclusion of additional buffers for domestic water sources, and hand piling slash for burning as opposed to broadcast burning. Future oil and gas develoment with 1/4-mile of these areas would be allowed, but with no surface occupancy. See Table 2-1 for BLM-managed acres located within identified Rural Interface Areas by alternative.

BLM Boat Ramp on the North Umpqua River.

Alternative C

Water Quality and Riparian Areas

Riparian Management Areas would be established with the following expected average widths (horizontal distance) on each side of perennial streams and other waters: 3rd order streams, 105 feet; 4th order, 150 feet; 5th order, 210 feet; 6th order and larger, 240 feet; other waters (such as lakes), 150 feet. Actual RMA widths would be determined by on the ground riparian vegetation and stream characteristics. The integrity of the 25 foot hardwood and brush vegetative strip left along each side of first and second order intermittant streams would be maintained during harvest, site preparation, and reforestation.

Attempts would be made to obtain land from private land owners to bring BLM ownership within the experimental/demonstration watersheds to 75 percent.

Old-Growth and Mature Forest

Forest lands in the TPCC categories of Non-suitable Woodland, Suitable Woodland—Low Site, and Suitable Woodland—Non-suitable Commercial Forest Land would not be available for planned harvest. Other forest lands allocated for Riparian Management Areas, recreation sites, threatened and endangered species recovery areas where timber harvest is prohibited, and ACECs would also not be subject to planned harvest. These forest lands total 57,900 acres, of which 19,700 acres currently are old-growth and 13,500 acres are mature forest.

An additional 67,400 acres of forest land would be included in a system of old-growth restoration and retention areas maintained to retain and improve biological diversity. Of this land, 25,615 acres are currently old-growth and 13,459 acres are mature forest. All but 200 miles of road within these areas would be closed to public use.

The remaining 270,200 acres of forest land would be managed under partial stand retention prescriptions (See Timber Section below). The lands to be managed for a high level of partial retention would be considered potential replacements for old-growth restoration and retention areas lost to natural events.

The stands to be managed for a high level of partial retention and most of the old-growth restoration and retention areas are located within biological connectivity corridors designed to provide linkage between the lands of the Umpqua, Siuslaw, and Siskiyou National Forests and Eugene, Coos Bay, and Medford BLM Districts.

Agreements would be pursued with private landowners and other land management agencies to optimize the extent and distribution of old-growth restoration and retention areas while minimizing undue impact on multiple resource use.

Timber

There would be 270,200 acres available for constrained timber production. See Tables 2-1 and 2-4. Projected 10-year acres for timber harvest and other timber management activities are shown in Table 2-1. The allowable annual timber sale quantity for the expected 10-year life of the plan would be 11.2 mmcf (74 MMBF Scribner short log). In addition, an average annual unregulated volume of approximately 1.4 mmcf (7.3 MMBF) is expected to be available for sale from density management thinnings on lands not allocated to timber production. Since this alternative includes many elements recognized to be substantially untested, modeling its sustainable timber yield is more difficult than with the other alternatives. The level of confidence in the preceding numbers is therefore lower.

Regeneration harvests would be used to regenerate all indigenous tree species. This would be achieved through partial cutting, group selection, or a combination of these. Regeneration harvest of predominantly conifer stands would be conducted under one of two broad prescription concepts, except where uneven-age management is most appropriate for the stand (either for silvicultural reasons and/or to address another planning issue).

On 161,055 acres, the regeneration harvest prescription would be designed to retain an average of 35 percent of the normal live conifer basal area for the site (based on Technical Bulletin 201; Yield of Douglas-fir in the Pacific Northwest, McCardle, Meyer, Bruce, 1961), using an individual tree selection or a group selection harvest system.

Size of selected groups would be only as large as needed to assure regeneration, normally not exceeding one acre. These lands are situated in biological connectivity corridors identified through an interdisciplinary process, in analytical watersheds where federal lands are less than 25 percent of the forest land, and on lands within one to two miles of old-growth restoration and retention areas (See previous direction for Retention, Maintenance and/or Reestablishment of Old-Growth and Mature Forest). Figure 2-4 illustrates an example of this pattern.

On 110,960 acres the regeneration harvest prescription would retain an average of 20 percent of the normal live conifer basal area for the site (based on Technical Bulletin 201; Yield of Douglas-fir in the Pacific Northwest, McCardle, Meyer, Bruce, 1961), in a well-distributed pattern, with a range of sizes of dominant and codominant trees, including some of the larger trees in the stand. These lands are situated outside the areas defined in the preceding paragraph.

The reestablishment of old-growth conditions of the stands is expected to occur at an average of 100 years after regeneration harvest. Old-growth conditions in stands would be maintained for approximately 30 years before regeneration harvest. Regeneration harvests would occur at aproximately 150 years.

Harvest techniques, such as designated skid trails, that minimize impacts to soil and residual vegetation would be used. Where new roads are needed, road density would not exceed that needed if clearcut harvesting were planned. New roads would be constructed to the lowest practical standard and density consistent with resource protection and multiple use values. Road management, including closure, could be applied to meet biodiversity and multiple use needs.

Prescribed fire would be used as a favored tool for site preparation, fuel reduction, and to restore natural ecological processes. Herbicides would be used only as part of spot suppression of specific species to provide planting spaces or to release individual trees.

Natural regeneration following timber harvest would be encouraged through silvicultural prescriptions, sale design and reforestation planning. Artificial regeneration would supplement natural reforestation to minimize regeneration lag, but with wide spacing, to allow for a natural regeneration in the new stand and to delay crown closure. Planting stock of commercial species would be used. Up to half of this stock would come from superior tree seed collected from wild trees or from seed orchards developed from wild trees. Mixed species would be used to assure diversity of regeneration.

Conversion of natural vegetation (e.g., hardwood) sites would not occur. Hardwood stands on hardwood sites would be managed for sustained yield timber production. Hardwood stands on conifer sites (except designated wild turkey areas) would be converted to conifer production, but would retain hardwoods in the reestablished stand.

In conifer stand management, native hardwoods would be retained or restored as part of the forest mix, to enhance biodiversity, provide natural fertilizatio and aid in forest protection from wildfire. Hardwoods would be artificially regenerated where natural propagation is not likely. The goal would be to retain or attain a hardwood component resembling that which occurred naturally or to exceed that level to emphasize retention of species that play significant ecological roles.

Fertilization would be used only where relevant to supplement natural nitrogen fixation, enhance growth, and hasten development of structure and large trees.

Wherever feasible on both lands available for timber production and lands in old-growth restoration and retention areas which do not possess old-growth characteristics, intermediate harvests would be part of density management along with precommercial thinnings. The objective would be to maintain open canopy conditions and promote retention of mixed species, as well as accelerate development of old-growth structure conditions. To the extent that stand conditions permit, intermediate harvests would leave enough snags and dead-and-down material to meet Old-Growth Definition Task Group standards (Pacific Northwest Research Station Note PNW-447, July 1986).

Special Status Species Habitat

Management would be designed on O&C and CBWR lands to protect federal candidate, state listed, and Bureau sensitive species and their habitats when such actions would not diminish commercial use. Mitigating measures that would not reduce commercial use would be implemented on O&C and CBWR lands. All special status species and their habitats would be protected on public domain land and areas maintained to conserve biological diversity. When it is considered biologically appropriate, special status species habitat would be protected by a 300 foot special habitat buffer from all surface disturbance and harvest of timber on public domain lands, in old-growth restoration and retention areas, and in biological corridors. Federal candidate species known only to occur on BLM-administered lands would be protected to the extent necessary to prevent their federal listing. A field or office review would be conducted on all proposed actions.

Bald Eagle Habitat

The Umpqua River Corridor Habitat Management Plan for bald eagles on 3,350 acres would continue to be implemented. Delineated bald eagle habitat would not be considered for disposal. Acquisition of conservation easements or ownership of lands within active or future occupied bald eagle territories would be pursued. Priority would be placed on acquiring lands adjacent to the Cougar Creek and Woodruff Mountain sites (200 acres). Site specific habitat management plans would be developed for all occupied nesting territories. Implement a seasonal road closure from February 15th to August 31 on 1.5 miles of road at the head of Huntley Creek to limit disturbance in an active nesting territory.

Peregrine Faclon Habitat

At present there are no known Peregrine falcon nesting sites on district BLM-administered lands. Peregrine falcon nesting cliffs occupied in the future would have seasonal disturbance restrictions within 1/2-mile placed around them including mining and mineral leases. Occupied sites would be protected to maintain features important to peregrines. Pesticides which have a negative effect on prey species or their habitat would not be applied within two miles of active sites. Habitat management plans would be written for all active Peregrine falcon sites. A proposal would be developed and implemented to operate one hack site (a site where captive birds are released into the wild) on the district.

Columbian White-tailed Deer

In order to achieve the recovery plan goal of assuring 5,500 acres of secure habitat for the Columbian White-tailed deer, acquisition of suitable habitat would be pursued within the core area (primarily T. 26 S., and T. 27 S., R. 5 W.). Habitat management plans would be prepared for lands acquired for the recovery of this species or for existing lands determined to be of significant value to the species.

Townsend's Big-eared Bat

Townsend's big-eared bat nurseries, roosts and hibernacula would be protected and buffered by 600 feet to maintain the integrity of sites. Access and human disturbance would be limited near roosts and hibernacula to prevent detrimental impacts to colonies.

Other Wildlife Habitat

Wildlife Tree and Down Log

Timber harvest would be designed to retain (where available) adequate snags and down wood to meet Old-Growth Definition Task Group standards, which vary according to plant community. For Douglas-fir on mixed-conifer sites the minimum standards would be 1-1/2 snags per acre, 20 inches in diameter, and 15 feet tall; and the down log material which includes at least two pieces 24 inches in diameter and 50 feet long. A total of 350 linear feet of down-and-dead logs of all diameter size classes would be retained, if available.

Roosevelt Elk Habitat

Precommercial thinning projects would provide for maintenance of existing game trails free of slash accumulation that impede big game movement.

Management of elk habitat would be emphasized in the Tyee and Camp Creek elk management areas. The following guidelines would be adopted for timber harvest units:

1. Thirty percent of the harvest units would be small units (15 to 20 acres) with irregular boundaries.
2. Within harvest units the distance to cover would not exceed 500 feet.
3. Minimum width of cover adjacent to harvest units would be 200 feet.

Road management within the Tyee, Camp Creek, and Deadman Mountain elk management areas would be guided by a goal to limit the amount of habitat available to vehicle access and the increased disturbance and poaching which can occur with such access. Disturbance from vehicle access would be limited by:

1. Implementing year long road closures on approximately 20 miles of existing roads.
2. Implementing approximately 15 miles of year long road closure on existing roads in the Deadman Mountain elk management area to establish approximately 6000 acres (at the head of Days and Coffee Creeks) with restricted disturbance.
3. Use and management of newly constructed roads would be guided by BLM's effectiveness in limiting open road densities to 1.5 to 2.5 miles per square mile on BLM-administered lands.

Wild Turkey Habitat

All oak stands would be maintained within designated turkey habitat utilizing a variety of methods including prescribed fire. A minimum of one ten acre stand of roosting habitat would be provided in each section of designated turkey habitat. Roosting habitat would contain the following components:

- A scattering (8-10) of large (larger than 24 inches dbh) open limbed conifer trees on each acre.
- Ponderosa pine, when available, would be preferred roost trees.

Other Raptor Habitat

An allocation would be made of 500 acres of forest land to be used for protecting known and future located raptor nest sites not protected by other management recommendations.

Special Habitat Areas

Special habitat areas would be buffered by 100-200 feet from all surface disturbance and harvest of timber to protect their plant community structure, species composition, and ecological processes. Water courses flowing into and out of wetland habitats would be maintained.

Special Areas

Eight existing Special Areas would be retained, four of these existing Special Areas would be expanded. Two new Special Areas would be designated. Three of these would be ACECs. The remaining seven would be ACEC/RNAs. Total allocation would be 4375 acres. See Table 2-5. All ACEC/RNAs would be withdrawn from locatable mineral entry and would have a no surface occupancy stipulation for leasable minerals.

Recreation

Cow Creek Canyon would be managed as a Special Recreation Management Area.

All existing recreation sites and trails would be maintained and managed. See Table 2-3 for recreation sites to be acquired or withdrawn from mineral entry or appropriation under the general land laws.

In order to retain options for future development of high value potential recreation sites, trails and siteseeing opportunities, no timber sales other than salvage sales of dead and dying timber would be made on 1,765 acres encompassing the following areas:

Riverview
Umpqua Boat Launch
Iron Mountain Gold Panning Area
Rader-Wolf Creek Watchable Wildlife Trail
Cow Creek Canyon SRMA
Susan Creek Falls Barrier Free Trail
Deadman Mountain Trail
Wolf Creek Falls extention
North Umpqua Trail Primitive Campsite
South Bank Swiftwater Day Use
Hardscrabble Recreation Site
Pickett Bridge Recreation Site
Tyee Mountain Trail

An exception to timber salvage or harvest would be made in the event a natural disturbance (e.g., fire, windstorm) destroyed the high value recreation potential of the area.

To develop the Hardscrabble and Riverview potential recreation sites land acquisition would be pursued. This would involve acquiring approximately 40 acres in two different ownerships located in Section 12, T. 22 S., R. 6 W., W.M. and approximately 131 acres in Section 32, T. 23 S., R. 7 W., W.M. for the Riverview site.

The following existing or potential recreation sites would be withdrawn from locatable mineral entry or have their existing withdrawals expanded:

Susan Creek Recreation Site
Recreational Gold Panning Area
North Umpqua Trail Primitive Campsite
Umpqua Boat Launch
Riverview
Iron Mountain Gold Panning Area
Pickett Bridge Recreation Site

A total of 404 acres would be proposed for withdrawal from public land and mineral law. There would be 19,500 acres and 90 miles of existing road closed to vehicle use either seasonally or year-round other than for administrative purpose and commodity extraction. See Table 2-1 for comparisons of road closures. Areas currently closed to ORV use would continue to be closed. In addition, 4,375 acres of lands designated as ACECs and 170 acres of lands occupied by Special Status plants would also be closed to ORV use.

Wild and Scenic Rivers

No additional rivers would be recommended suitable for federal designation as part of the National Wild and Scenic system.

Visual Resources

Available forest land where federal ownership consists of more than half of a viewshed and available forest land adjacent to (within 1/4-mile) developed recreation sites, state and federal highways, state scenic waterways, and rivers designated under the federal Wild and Scenic Rivers Act would be managed as inventoried. All other available forest land would be managed as VRM Class IV, except as noted under Rural Interface Area Management. The remaining lands would be managed as inventoried. Acres that would be managed for each VRM Class are shown in Table 2-1.

Land Tenure

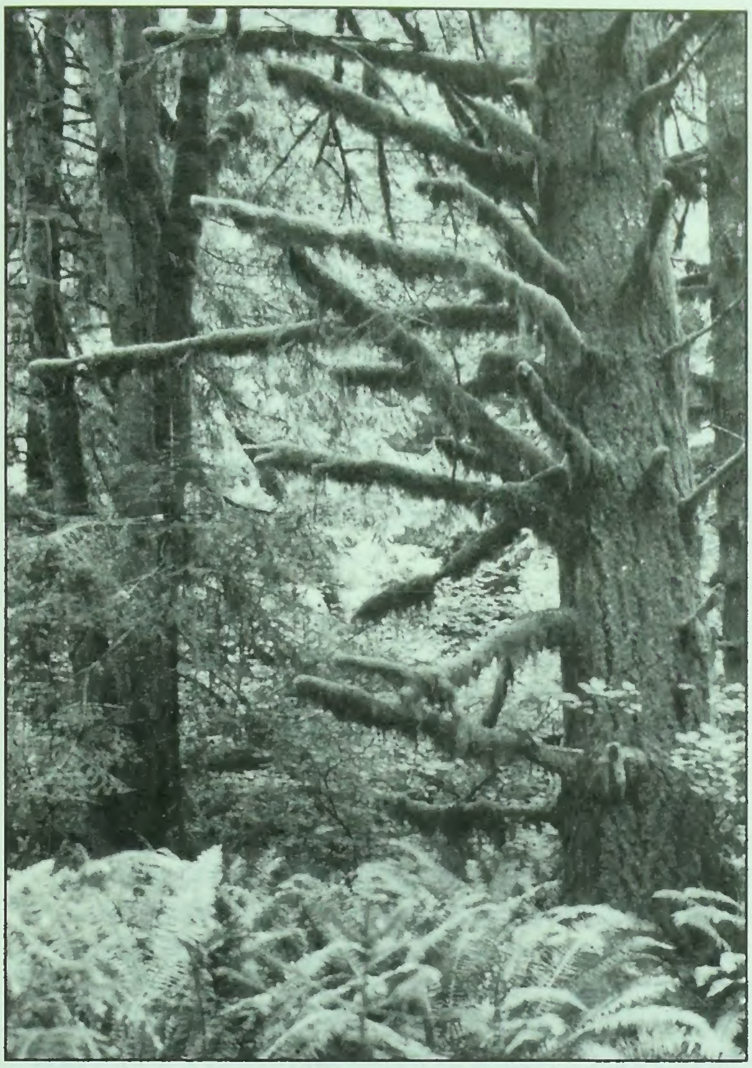
Exchanges of public domain lands would be made to benefit any of the resources managed, including non-timber values. Exchanges of O&C and CBWR lands would emphasize opportunities that would contribute to conservation of biological diversity or would enhance timber management opportunities. Sale of O&C and CBWR lands other than available commercial forest lands and of public domain lands would be made to dispose of lands that meet any of the criteria of FLPMA Section 203(a). Leases of such lands would be made to accommodate other appropriate uses. Leases or conveyances under the Recreation and Public Purposes Act would be made in Zones 2 and 3 to provide appropriate facilities or services. Areas identified for acquisition and/or land withdrawal are identified in the Special Areas, Special Status Species habitat, Recreation, and Water Quality and Riparian Areas sections of this chapter.

Energy and Minerals

The majority of the mineral estate administered by the BLM would continue to be available for leasable minerals, open to location under mining laws and open to sale of salable minerals. Withdrawals totaling 2,924 acres would be proposed under this alternative for ACEC/RNAs and recreation sites. See Tables 2-5 and 2-3. See Tables 2-7, 2-8, and 2-9 for comparison of mineral restrictions by alternative.

Rural Interface Areas

There are 8,552 acres of BLM-administered lands within 1/4-mile of private land in the identified rural interface areas (zoned for one to five acre lots) that would be managed for VRM Class III objectives. Alternative timber management practices would be applied on these lands to mitigate the adjacent neighbors concern. Examples of management options include harvest regimes other than clearcutting, hand application rather than aerial application of herbicides and pesticides, inclusion of additional buffers for domestic water sources, and hand piling slash for burning as opposed to broadcast burning. Future oil and gas development within 1/4-mile of these areas would be allowed, but with no surface occupancy. See Table 2-1 for BLM-adminstered acres located within identified Rural Interface Areas by alternative.



Old-Growth.

Alternative D

Water Quality and Riparian Areas

RMAs would be established with the average widths on each side of the following streams and other waters: 2nd order, 60 feet; 3rd order, 140 feet; 4th order, 200 feet; 5th order, 280 feet; 6th order and larger, 320 feet; other waters (e.g., lakes), 200 feet. Actual RMA widths would be determined by on the ground vegetation and stream characteristics.

Land acquisition would be pursued to maximize public ownership within the experimental/demonstration watersheds.

Old-Growth and Mature Forest

Forest lands in the TPCC categories of Non-suitable Woodland and Suitable Woodland would not be available for planned harvest. Other forest lands allocated for Riparian Management Areas, recreation sites, undisturbed protection of special status species, and ACECs would also not be subject to planned harvest. These forest lands total 112,200 acres, of which 25,900 acres currently are old-growth and 17,600 acres are mature forest.

An additional 108,100 acres of forest land would be set aside from timber harvest and new road construction, and managed according to recommendations of the Interagency Scientific Committee's Conservation Strategy for the Northern Spotted Owl. Of this land 37,300 acres are currently old-growth and 24,800 acres are mature forest.

Timber

There would be 159,300 acres available for unrestricted timber practices and managed under the 50-11-40 rule. There would be 47,900 acres managed for restricted timber practices in VRM II and RIAs. See Tables 2-1. Projected 10-year acres for timber harvest and other timber management activities are shown in Table 2-1. The allowable annual timber sale quantity for the expected 10-year life of the plan would be 17.3 mmcf (92 MMBF Scribner short log).

Special Status Species Habitat

All BLM-administered land would be managed for the conservation and protection of special status species and their habitats. When it is considered biologically appropriate, special status species habitat would be protected by a 300 foot special habitat buffer. Field or office reviews would be conducted on all proposed actions.

Northern Spotted Owl Habitat

Management for the northern spotted owl would incorporate those strategies and guidelines identified in the Interagency Scientific Committee (ISC) Report (Thomas et al. 1990). Spotted owl habitat conservation areas (HCA) would be established as shown on the Alternative D map. Timber harvest would not be planned in these areas, and logging and other silvicultural activities (except stand regeneration) would not be conducted. Road construction in HCAs would take place only where no feasible alternative exists. When roads are constructed in HCAs, they would be located and engineered to minimize loss and alteration of spotted owl habitat, and would not be located within 1/4-mile of the activity center of any spotted owl pair. Reforestation activities on cutover lands in HCAs would encourage a mix of species. In each quarter township, lands would be managed so that 50 percent of the forest on Federal-administered lands outside HCAs would have stands averaging 11 inches or more dbh with at least 40 percent canopy closure.

Bald Eagle Habitat

The Umpqua River Corridor Habitat Management Plan for bald eagles would continue to be implemented. Delineated bald eagle habitat would not be considered for disposal. Acquisition of conservation easements or ownership of lands would be pursued within active or future occupied bald eagle territories. Priority would be placed on acquiring land adjacent to the Cougar Creek and Woodruff Mountain sites (approximately 200 acres). Site specific habitat management plans would be developed for all occupied nesting territories.

Peregrine Falcon Habitat

At present there are no known Peregrine falcon nesting sites on district BLM-administered lands. Peregrine falcon nesting cliffs occupied in the future would have seasonal disturbance restrictions within 1/2-mile placed around them including mining and mineral leases. Occupied sites would be protected to maintain features important to peregrines. Pesticides which have a negative effect on prey species or their habitat would not be applied within two miles of active sites. Habitat management plans would be written for all active Peregrine falcon sites.

Columbian White-tailed Deer

In order to achieve the recovery plan goal of assuring 5,500 acres of secure habitat for the Columbian White-tailed deer, acquisition of suitable habitat would be pursued within the core area (primarily T. 26 S., and T. 27 S., R. 5 W.). Habitat management plans would be prepared for lands acquired for the recovery of this species or for existing lands determined to be of significant value to the species. Timber harvest or other vegetation altering activities on all BLM-administerd lands (6,161 acres) within the general area of distribution would occur only if determined to be beneficial to the Columbian White-tailed deer or until definitive information is available on the level of use and value of the area in meeting recovery plan goals.

Townsend's Big-eared Bat

Townsend's big-eared bat roosts and hibernacula would be protected and buffered by 600 ft. to maintain the integrity of sites. Access and human disturbance would be limited near roosts and hibernacula to prevent detrimental impact to colonies. The use of pesticides which are detrimental to prey species or their habitat within the normal hunting range of known bat nursery colonies and hibernacula would be restricted. The restriction would apply on an area within a two mile radius or until site specific monitoring proved otherwise. BLM would pursue acquisition of the Scott Mountain hibernaculum consisting of aproximately 10 acres.

Other Wildlife Habitat

Wildlife Tree and Down Log

All soft snags would be retained consistent within safety standards, three hard snags per acre (larger than 20 inches dbh and 10 feet tall), and two green trees per acre, larger than 20 inches dbh. Where available prior to timber harvest, a total of 350 linear feet per acre of down logs would be retained in final harvest timber sale units. These would include all Class 1 logs if hollow or rotten and Class 2 and 3 logs larger than 20 inches in diameter. Smaller material would be left on site unless removal is needed for tree planting.

Roosevelt Elk Habitat

Precommercial thinning projects would provide for maintenance of existing game trails free of slash accumulation that impede big game movement.

Management of elk habitat would be emphasized in the Tyee, Camp Creek, and Deadman Mountain elk management areas. The following guidelines would be adopted for timber harvest units:

1. Thirty percent of the harvest units would be small units (15 to 20 acres) with irregular boundaries.
2. Within harvest units the distance to cover would not exceed 500 feet.
3. Minimum width of cover adjacent to harvest units would be 200 feet.

Road management within the Tyee, Camp Creek, and Deadman Mountain elk management areas would be guided by a goal to limit the amount of habitat available to vehicle access and the increased disturbance and poaching which can occur with such access. Disturbance from vehicle access would be limited by:

1. Implementing year long road closures on approximately 20 miles of existing.
2. Implementing approximately 15 miles of year long road closure on existing roads in the Deadman Mountain elk management area to establish approximately 6000 acres (at the head of Days and Coffee Creeks) with restricted disturbance.
3. Use and management of newly constructed roads would be guided by BLM's effectiveness in limiting open road densities to 1.5 to 2.5 miles per square mile of BLM-administered lands.
4. Spur roads not needed over a ten year or longer period would be closed to achieve a road density of 1.5 to 2.5 miles per square mile of BLM-administered lands.

In addition to the harvest unit guidelines for the Tyee, Camp Creek, and Deadman Mountain elk management areas, the overall landscape on BLM-administered lands within these areas would be managed under the following guidelines:

1. BLM-administered land outside of HCAs would be managed to achieve a forage/cover habitat ratio of 70/30 across the landscape.
2. On 50 percent or more of the harvest units a legume seed mix would be applied to improve forage quality.
3. Retain a screen of trees between open roads and harvest units when the unit is largely visible from the road.

Osprey Habitat

On BLM-administered lands within 1/4-mile of known osprey nest sites (2,500 total acres), nest trees and adjacent perch trees would be protected and disturbance would be restricted between March 20 and August 31. Adequate nest and perch replacement trees would be retained within 1/4-mile of nest sites.

Other Raptor Habitat

An allocation of 500 acres of forest land would be made to be used for protecting known and future raptor nest sites not protected by other management recommendations.

Special Habitat Areas

Special habitat areas would be buffered by 100-300 feet to protect their plant community structure, species composition, and ecological processes. The special habitat buffer would be an area designated and managed for the protection or enhancement of the special habitat. Activities such as timber harvest, timber salvage, and prescribed burning would be permitted within the buffers when they are considered necessary for special habitat restoration and would benefit resident special habitat species. Water courses flowing into and out of wetland habitats would be maintained.

Special Areas

Six existing Special Areas would be retained, four of these existing Special Areas would be expanded. Three new Special Areas would be designated. Total allocation would be 5,102 acres. See Table 2-5. The existing Brad's Creek and Golden Bar ACECs would be included in the new Umpqua Wildlife ACEC under this alternative. All ACEC/RNAs would be withdrawn from locatable mineral entry and would have a no surface occupancy stipulation for leasable minerals.

Recreation

Cow Creek Canyon would be managed as a Special Recreation Management Area. Interpretive opportunities along the Cow Creek Backcountry Byway would be emphasized. Emphasis would also be put on recreational gold panning, camping, hiking, and other dispered recreational opportunities in this SMRA.

All existing recreation sites and trails would be maintained and managed. See Table 2-3.

To develop the Hardscrabble, Riverview, and Island Creek potential recreation sites land acquisition would be pursued. This land acquisition would involve acquiring approximately 40 acres in two different ownerships located in Section 12, T. 22 S., R. 6 W., W.M., for the Hardscrabble site, approximately 60 acres in Section 1, T. 31 S., R. 7 W., W.M. and Section 36, T. 30 S., R. 7 W., W.M. for the Island Creek site, and approximately 131 acres in Section 32, T 23 S., R. 7 W., W.M. for the Riverview site.

The following existing or potential Recreation sites would be withdrawn from locatable mineral entry or have their existing withdrawals expanded:

Riverview
Susan Creek Recreation Site
Recreational Gold Panning Area
North Umpqua Trail Primitive Campsite
Umpqua Boat Launch
Iron Mountain Gold Panning Area
Island Creek Recreation Site
Pickett Bridge Recreation Site

A total of 566 acres would be identified for withdrawal from public land and mineral law.

To retain options for future development of high value potential recreation sites and facilities for dispersed recreation opportunities, no timber sales other than salvage sales of dead and dying timber would be made from 2,264 acres encompassing the following areas.

Potential Recreation Sites

North Umpqua Trail Primitive Campsite
South Bank Swiftwater Day Use
Susan Creek Group Reservation Campsite
Riverview
Camp Tyee
Umpqua Boat Launch
Hardscrabble Recreation Site
Island Creek Recreation Site
Weaver Road Pond
McNab Creek Pond
Michigan Springs
Brickyard Pond
Lavadoure Boat Ramp
Chimney Rock Pond
Red Top Pond
Iron Mountain Gold Panning Area
Hubbard Creek ORV Area
Pickett Bridge Recreation Site

Potential Trails

Cow Creek Bluffs
Cow Creek Trail
Deadman Mountain Trail
Rader-Wolf Creek Watchable Wildlife
Wolf Creek Falls Extention
Upper Susan Creek Falls Trail
Susan Creek Falls Barrier Free Trail
Tyee Mountain Trail

Potential SRMA

Cow Creek Canyon SRMA*

*Encompasses 1/4-mile each side of Cow Creek

An exception would be made in the event a natural disturbance (e.g., fire, windstorm) destroyed the high value recreation potential of the area.

Around the man made ponds where helicopters may be dipping water for fire suppression, trees would be cut when necessary to maintain open flyways to the pond.

To develop the proposed Cow Creek Bluffs Trail and the Upper Susan Creek Falls Trail, acquisition of access would be pursued across approximately 4,000 feet of private land.

There would be 19,500 acres and 90 miles of existing road closed either seasonally or year round to vehicle use other than for administrative purpose and commodity extraction. See Table 2-1 for comparisons of road closures.

In addition, 5,102 acres of lands designated as ACECs and 374 acres of lands identified as containing special status plants would also be closed to off road vehicle use. An additional 117,935 acres of land containing threatened and endangered species would be placed in an ORV restricted category allowing ORVs only on open roads and trails.

Wild and Scenic Rivers

No additional rivers would be recommended suitable for federal designation as part of the National Wild and Scenic Rivers system.

Visual Resources

All lands except rural interface areas (see below) would be managed as inventoried for their visual characteristics. Acres that would be managed for each VRM Class are shown in Table 2-1.

Land Tenure

Exchanges or acquisitions would be made to benefit any of the resources managed. Exchanges involving disposal of timber lands to acquire lands containing greater non-timber values would be emphasized. Lands other than available commercial forest lands that meet criteria (1) or (2) of FLPMA Sec. 203(a) would be available for disposal through sale, but sales of land that meet only criteria (3) would not be made. (See Land Tenure Management, Common to All Alternatives for explanation of criteria). No lands would be leased, except leases and conveyances under the Recreation and Public Purposes Act in Zones 2 and 3 would be made to provide appropriate facilities or services.

Areas identified for acquisition and/or land withdrawal are identified in Special Area, Special Status Species Habitat, Wildlife Habitat, Water Quality and Riparian Areas, and Recreation sections of this alternative.

Energy and Minerals

The majority of the mineral estate administered by the BLM would continue to be available for leasable minerals, open to location under mining laws and open to sale of salable minerals. See Tables 2-7, 2-8, and 2-9. Withdrawals totaling 3,101 acres would be proposed under this alternative for ACEC/RNAs and recreation sites. See Tables 2-5 and 2-3.

Rural Interface Areas

There are 8,552 acres of BLM-administered lands within 1/4-mile of private land in identified rural interface areas zoned by Douglas County for one to five acre lots which would be managed for VRM Class II objectives. The following alternative timber management practices would not be applied on those lands: herbicide spraying, clear cutting, and prescribed burning. Future oil and gas development within 1/4-mile of these areas would be allowed, but with no surface ocupancy. See Table 2-1 for comparison of BLM-managed acres located within identified Rural Interface Areas by alternative.

Northern Spotted Owl.

Alternative E

Water Quality and Riparian Areas

RMAs would be established with average widths on each side of the following streams and other waters: 1st order, 50 feet; 2nd order, 60 feet; 3rd order, 140 feet; 4th order, 200 feet; 5th order, 280 feet; 6th order and larger, 320 feet; and other waters (such as lakes), 200 feet. Actual RMA widths would be determined by on the ground vegetation and stream characteristics.

Land acquisition would be pursued to acquire lands to maximize public land ownership within the experimental/demonstration watersheds and Canton Creek.

Old-Growth and Mature Forest

Forest lands in the TPCC categories of Non-suitable and Suitable Woodland, plus Suitable Commercial Forest Land on Site V lands and the Fragile Gradient - Restricted component of the Fragile Suitable TPCC category, would not be subject to planned harvest. Other forest lands allocated for Riparian Management Areas, recreation sites, proposed recreation river corridors, undisturbed protection of special status species, and ACECs would also not be subject to planned harvest. These forest lands total 114,700 acres, of which 36,300 acres currently are old-growth and 26,800 acres are mature forest.

An additional 76,700 acres of existing old-growth forest stands plus 43,900 acres of mature forest would not be subject to planned harvest. In addition 60,000 acres of forest land within 400 feet of stands over 150 years old would not be subject to planned harvest in order to assist in maintaining natural ecological elements, protect the older stands from edge effect and natural disaster, and interconnect them into a sustainable network. 55,953 acres of forest land in early, mid, or late seral stages not accounted for in previous categories, but lying within approximately two miles of spotted owl nests or habitat cores occupied in recent years, or allocated to headwater protection, or cavity dwellers would also not be subject to planned harvest.

Timber

There are 23,900 acres available for unrestricted timber practices, and 23,400 acres for restricted timber practices. See Tables 2-1. Projected 10-year acres for timber harvest and other timber management activities are shown in Table 2-1. The allowable annual timber sale quantity for the expected 10-year life of the plan would be 3.2 mmcf (18 MMBF Scribner short log).

Special Status Species Habitat

All BLM-administered land would be managed for the conservation and protection of special status species and their habitats. Field or office reviews would be conducted on all proposed actions. When it is considered biologically appropriate, special status species habitat would be buffered by 600 feet from all surface disturbance and harvest of timber. Other special status species would be protected to varying degrees on all BLM-administered lands. See Table 2-1.

Bald Eagle Habitat

The Umpqua River Corridor HMP for bald eagles would continue to be implemented. All designated lands managed for bald eagles would be retained and acquisition of conservation easements or ownership of land within active or future occupied nest sites would be pursued . Habitat management plans would be developed on active bald eagle sites not covered by an existing plan (9,800 acres).

A 1/2-mile protective corridor would be provided on both sides of the Umpqua River system in which the management guidelines listed under all previous alternatives would be applied. In addition, inventories would be conducted for communal winter roosts along river corridors and on the uplands. A 1/4-mile buffer would be established around eagle roosts located in the future to maintain environmental conditions and limit disturbance during the winter months. Withdraw bald eagle occupied nest sites from mineral entry where needed to protect habitat components and limit disturbance.

Peregrine Falcon Habitat

At present there are no known Peregrine falcon nesting sites on district BLM-administered lands. Peregrine falcon nesting cliffs occupied in the future would have seasonal disturbance restrictions within 1/2-mile placed around them including restrictions on mining and mineral leases. Occupied sites would be protected to maintain features important to peregrines. Pesticides which have a negative effect on prey species or their habitat would not be applied within two miles of active sites. Habitat management plans would be written for all active Peregrine falcon sites. The adequacy of suitable nesting ledges for Peregrine falcons would be evaluated at all potential sites on BLM-administered lands and ledges would be created where lacking.

Columbian White-tailed Deer

In order to achieve the recovery plan goal of assuring 5,500 acres of secure habitat for the Columbian White-tailed deer, acquisition of suitable habitat would be pursued within the core area (primarily T. 26 S., and T. 27 S., R. 5 W.). Habitat management plans would be prepared for lands acquired for the recovery of this species or for existing lands determined to be of significant value to the species. Timber harvest or other vegetation altering activities on all BLM-administerd lands (6,161 acres) within the general area of distribution would occur only if determined to be beneficial to the Columbian White-tailed deer or until definitive information is available on the level of use and value of the area in meeting recovery plan goals.

Townsend's Big-eared Bat

Townsend's big-eared bat roosts and hibernacula would be protected and buffered by 600 ft. to maintain the integrity of sites. Access and human disturbance would be limited near roosts and hibernacula to prevent detrimental impact to colonies. The use of pesticides which are detrimental to prey species or their habitat within the normal hunting range of known bat nursery colonies and hibernacula would be restricted. The restriction would apply on an area within a two mile radius or until site specific monitoring proved otherwise. BLM would pursue acquisition of the Scott Mountain hibernaculum consisting of approximately 10 acres.

Other Wildlife Habitat

Wildlife Tree and Down Log

All soft snags would be retained consistent with safety standards, three hard snags per acre (larger than 20 inches dbh and 10 feet tall), and two green trees per acre, larger than 20 inches dbh. In addition, 20 percent of the land in each harvest unit would be retained in two acre or larger patches as unentered cavity nester habitat.

Where available, prior to timber harvest, a total of 350 linear feet per acre of down logs would be retained in final harvest timber sale units. These would include all Class 1 logs if hollow or rotten and Class 2 and 3 logs larger than 20 inches in diameter. Smaller material would be left on site unless removal is needed for tree planting.

Amphibian Habitat

To provide habitat for amphibians and nesting for pileated woodpeckers, BLM would protect a 40 acre block in each section where BLM administers at least half of the land by withdrawing from planned harvest an additional 635 acres of forest land (the oldest stands concentrated around headwater streams, not set aside for other purposes).

Roosevelt Elk Habitat

Precommercial thinning projects would provide for maintenance of existing game trails free of slash accumulation that impede big game movement.

Management of elk habitat would be emphasized in the Tyee, Camp Creek, Deadman Mountain, Rock Creek, and Little River elk management areas. The following guidelines would be adopted for timber harvest units:

1. Thirty percent of the harvest units would be small units (15 to 20 acres) with irregular boundaries.
2. Within harvest units the distance to cover would not exceed 500 feet.
3. Minimum width of cover adjacent to harvest units would be 200 feet.

Road management within the Tyee, Camp Creek Deadman Mountain, Rock Creek, and Little River elk management areas would be guided by a goal to limit the amount of habitat available to vehicle access and the increased disturbance and poaching which can occur with such access. Disturbance from vehicle access would be limited by:

1. Implementing year long road closures on approximately 20 miles of existing roads as identified in the current MFP.
2. Implementing approximately 15 miles of year long road closure on existing roads in the Deadman Mountain elk management area to establish approximately 6,000 acres (at the head of Days and Coffee Creeks) with restricted disturbance.
3. Use and management of newly constructed roads would be guided by BLM's effectiveness in limiting open road densities to 1.5 to 2.5 miles per square mile of BLM-administered lands.
4. Spur roads not needed over a ten year or longer period would be closed to achieve a road density of 1.5 to 2.5 miles per square mile of BLM-administered lands.

In addition to the harvest unit guidelines for the Tyee, Camp Creek, Deadman Mountain, Rock Creek and Little River elk management areas, the overall landscape on BLM-administered lands within these units would be managed under the following guidelines:

1. On 50 percent or more of the harvest units a legume seed mix would be applied to improve forage quality.
2. Retain a screen of trees between open roads and harvest units when the unit is largely visible from the road.

In cooperation with the ODFW, conduct elk transplants to supplement existing numbers and establish new herds in the Rock Creek, Little River, White Rock, West Fork Cow Creek, Middle Creek, and Green Butte elk areas.

The Tyee and Camp Creek elk management areas would be targeted for more balanced management of all elk habitat through blocking of public ownership of lands. These two management areas would be priority areas for increasing BLM-administered lands as exchange opportunities arise.

Wild Turkey Habitat

Maintain all oak stands within designated turkey habitat utilizing a variety of methods including prescribed fire. Establish legume seeding areas in harvest units of three to five acres in size and distributed across the landscape at a rate of four or five per section in designated turkey habitat.

Osprey Habitat

Osprey nesting and forage habitat would be provided (8,385 acres) adjacent to major water areas (Umpqua Rivers, Cow Creek, Elk Creek, Ben Irving and Cooper Creek Reservoirs) by protecting existing and potential nest trees, adjacent perch trees and provide for adequate replacement trees. Disturbance would be restricted within 1/4-mile of active nest sites from March 20 to August 31.

Other Raptor Habitat

An allocation would be made of 1,000 acres of forest land to be used for protecting known and future raptor nest sites not protected by other management recommendation.

Black Bear, Cougar, Black-tailed Deer

Management practices identified for Roosevelt elk would generally enhance cougar, black bear and blacktail deer habitat. Practices such as retention of cover, seeding, and road management specified for elk management areas would be expanded to cover all lands in the district.

Special Habitat Areas

Special habitat areas would be buffered by to 100-300 feet to protect their plant community structure, species composition, and ecological processes. The special habitat buffer would be an area designated and managed for the protection or enhancement of the special habitat. Activities such as timber harvest, timber salvage, and prescribed burning would be permitted within the buffers when they are considered necessary for special habitat restoration and would benefit resident special habitat species. Water courses flowing in to and out of wetland habitats would be maintained.

Special Areas

Six existing Special Areas would be retained, four of these existing Special Areas would be expanded. Three new Special Areas would be designated. Total allocation would be 5,102 acres. See Table 2-5. The existing Brad's Creek and Golden Bar ACECs would be included in the new Umpqua River Wildlife ACEC under this alternative. All ACEC/RNAs would be withdrawn from locatable mineral entry and would have a no surface occupancy stipulation for leasable minerals.

Recreation

Cow Creek Canyon would be managed as a newly designated Special Recreation Management Area. Interpretive opportunities along the Cow Creek Backcountry Byway would be emphasized. Emphasis would also be put on recreational gold panning, camping, hiking and other dispersed recreational opportunities in this SRMA.

All existing recreation sites and trails would be maintained and managed. See Table 2-3.

To develop the Hardscrabble, Riverview, and Island Creek potential recreation sites, land acquisition would be pursued. This land acquisition would involve acquiring approximately 40 acres in two different ownerships located in Section 12, T. 22 S., R. 6 W., W.M., for the Hardscrabble site, and approximately 60 acres in Section 1, T. 31 S., R. 7 W., W.M. and Section 36, T. 30 S., R. 7 W., W.M. for the Island Creek site and approximately 131 acres in Section 32, T. 23 S., R. 7 W., W.M. for the Riverview site.

The following existing or potential Recreation sites would be withdrawn from locatable mineral entry or have their existing withdrawals expanded:

Riverview
Susan Creek Recreation Site
Recreational Gold Panning Area
North Umpqua Trail Primitive Campsite
Umpqua Boat Launch
Iron Mountain Gold Panning Area
Island Creek Recreation Site
North Umpqua River SRMA
Pickett Bridge Recreation Site

A total of 1,938 acres would be identified for withdrawal from public land and mineral law.

To retain options for future development of high-value potential recreation sites and facilities for dispersed recreation opportunities, no timber sales other than salvage sales of dead and dying timber would be made from 2,264 acres encompassing the following areas.

Potential Recreation Sites

North Umpqua Trail Primitive Campsite
South Bank Swiftwater Day Use
Susan Creek Group Reservation Campsite
Riverview
Camp Tyee
Umpqua Boat Launch
Hardscrabble Recreation Site
Island Creek Recreation Site
Weaver Road Pond
McNab Creek Pond
Michigan Springs
Brickyard Pond
Chimney Rock Pond
Lavadoure Boat Ramp
Red Top Pond
Hubbard Creek ORV Area
Iron Mountain Gold Panning Area
Pickett Bridge Recreation Site

Potential Trails

Cow Creek Bluffs
Cow Creek Trail
Deadman Mountain Trail
Rader-Wolf Creek Watchable Wildlife
Wolf Creek Falls Extention
Upper Susan Creek Falls Trail
Susan Creek Falls Barrier Free Trail
Tyee Mountain Trail

Potential SRMA

Cow Creek Canyon SRMA*

*Encompasses 1/4-mile each side of Cow Creek

An exception to timber salvage or harvest would be made in the event a natural disturbance (e.g., fire, windstorm) destroyed the high value recreation potential of the area.

Around man made ponds where helicopters may be dipping water for fire supression, trees would be cut when necessary to maintain open flyways to the pond.

Before Cow Creek Bluffs Trail and the Upper Susan Creek Falls Trail could be built, acquisition of access would be pursued across approximately 4000 feet of private land.

There would be 19,500 acres and 90 miles of existing road closed to vehicle use either seasonally or year round other than for administrative purposes and commodity extraction. See Appendix 2-12 for comparison of road closures. Areas currently closed to ORV use would continue to be closed. In addition, 5,102 acres of lands designated as ACECs and 374 acres of lands identified as containing special status plant species would also be closed to off road vehicle use. On all other BLM-administered land, ORV use would be restricted to open roads and trails and to those areas specifically identified for ORV use. The proposed Hubbard Creek ORV site would be one of these areas. ORV use will not be allowed on any designated hiking trails. See Table 2-1 for comparison of ORV restrictions.

Wild and Scenic Rivers

A total of 185 miles (Cow Creek 26 miles, Smith River 15 miles, South Umpqua 73 miles, Canton Creek 14 miles, and Umpqua 57 miles) would be found suitable for Federal designation as part of the National Wild and Scenic River system, with a recreation classification.

Visual Resources

VRM Class I management would be provided for all lands so inventoried plus all BLM-administered lands adjacent to (within 1/4-mile) developed recreation sites, state and federal highways, state scenic waterways, and rivers designated under the federal Wild and

Scenic Rivers Act. VRM Class II management would be provided for lands in identified Rural Interface Areas (see below), and all remaining lands inventoried as VRM Class II. Land inventoried as VRM Class III or IV would be managed as Class III. Acres that would be managed for each VRM Class are shown in Table 2-1.

Land Tenure

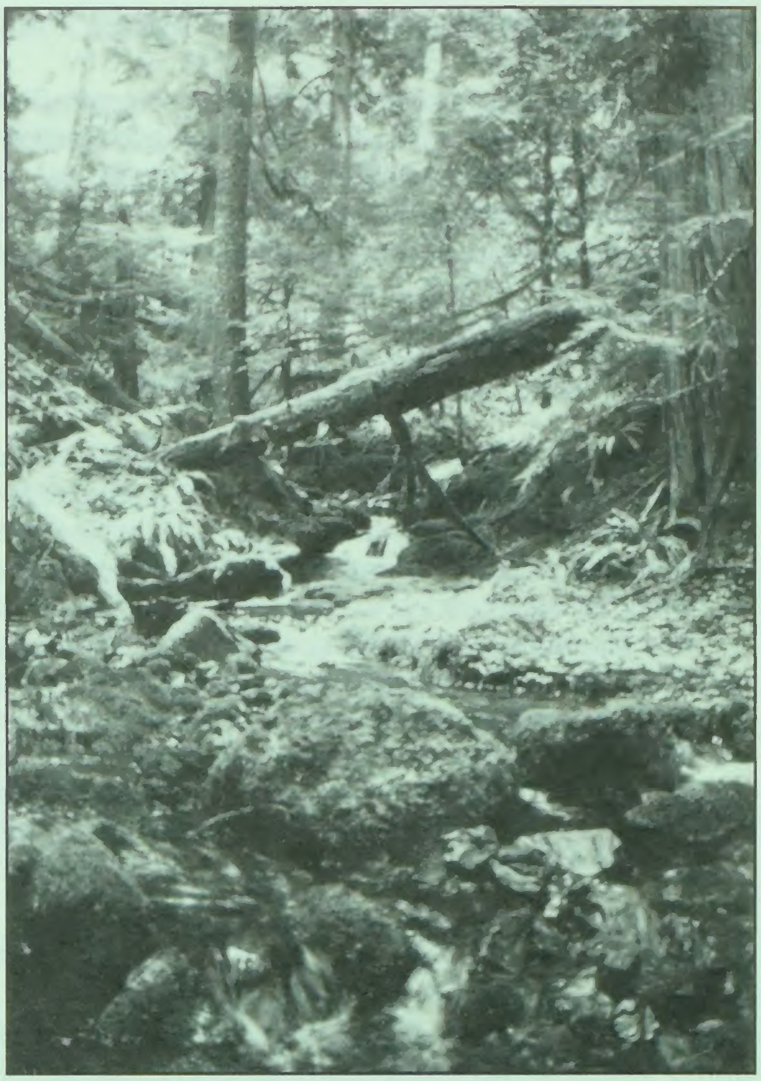
Exchanges or acquisition would be made to benefit any of the resources managed. Exchanges involving disposal of timber lands to acquire lands containing greater non-timber values would be emphasized. Sales of lands other than available commercial forest lands would be made to dispose of lands that meet criteria (1) or (2) of FLPMA Sec. 203(a) but sales of land which meet only criterion (3) would not be made. No lands would be leased, except leases and conveyances under the Recreation and Public Purposes Act in Zones 2 and 3 would be made to provide appropriate facilities or services. Areas identified for acquisition and/or land withdrawal are identified in Special Areas, Special Status Species Habitat, Other Wildlife Habitat, Water Quality and Riparian Areas, and Recreation sections of this alternative.

Energy and Minerals

The majority of the mineral estate administered by the BLM would continue to be available for leasable minerals, open to location under mining laws and open to sale of salable minerals. See Tables 2-8 and 2-9. Withdrawals totaling 3,101 acres would be proposed under this alternative for ACEC/RNAs and recreation sites. See Tables 2-5 and 2-3.

Rural Interface Areas

There are 24,052 acres of BLM-administered lands within 1/2-mile of private lands in the identified rural interface areas zoned by Douglas County for one to five acre lots which would be managed for VRM II objectives. Harvesting would employ multiple aged or even aged management silvicultural systems where feasible from a logging and stand management perspective, and small (under five acre) clearcuts or shelterwoods elsewhere. The silvicultural systems employed would not include the use of prescribed fire or herbicides. Future oil and gas develoment within 1/2-mile of these areas would be allowed, but with no surface occupancy. See Table 2-1 for BLM acres located within identified Rural Interface Areas by alternative.



Riparian Area.

Preferred Alternative

Water Quality and Riparian Areas

RMAs would be established with the average widths (50 ft. minimum) on each side of the following streams and other waters: All fish bearing streams, 150 ft.; 1st and 2nd order perennial, 75 feet; 3rd order, 105 feet; 4th order, 150 feet; 5th order, 210 feet; 6th order and larger, 240 feet; other waters (e.g., lakes), 150 feet. Actual RMA widths would be determined by on the ground vegetation and stream characteristics.

An attempt would be made to acquire lands from private landowners to maximize BLM ownership in Canton Creek.

Old-Growth and Mature Forest

Forest lands in the TPCC categories of Non-suitable Woodland and Suitable Woodland would not be available for planned harvest. Other forest lands allocated for Riparian Management Areas, recreation sites, North Umpqua Wild and Scenic River corridor, undisturbed protection of special status species, and ACECs would also not be subject to planned harvest. These forest lands total 62,300 acres, of which 21,400 acres currently are old-growth and 14,300 acres are mature forest.

An additional 121,900 acres of forest land would be designated as old-growth emphasis areas (OGEA). These OGEAs would be five large areas located in the Coast Range, Klamath Mountains and Cascade Range provinces. The management objective of these areas would be to retain or reestablish old-growth and mature forest and would be located to support regional biological diversity as well as long term viability of old-growth related species. Of the 153,400 total acres in OGEAs, 46,200 acres are old-growth and 29,400 acres are mature forest.

Five connectivity areas consisting of 66,400 acres of forest land would be managed to provide biological linkage between OGEAs, national forest lands, BLM districts, and physiographic regions (Coast Range, Cascade Range, Klamath Mountains). The connectivity areas are not designed for specific species, but generally are meant to allow for plant and animal species to migrate and disperse to areas of suitable habitat, and to avoid population or genetic isolation. Of the 82,000 total acres in connectivity areas, 22,700 acres are old-growth and 16,600 acres are mature forest.

An additional 144,300 acres of forest land would be designated as a general forest management area. The objective of management in the general forest management area would be to emphasize timber production while providing biological legacies and maintaining long term site productivity. Of the 184,00 total acres in the GFMA, 33,400 acres are old-growth and 30,700 acres are mature forest.

Timber

There would be 144,300 acres available for intensive forest management. An additional 188,300 acres would be available for constrained timber production. See Tables 2-1. Projected 10-year acres for timber harvest and other timber management activities are shown in Table 2-1. The allowable annual timber sale quantity for the expected 10-year life of the plan would be 16.3 mmcf (105 MMBF Scribner short log). Since this alternative includes some elements recognized to be substantially untested, modeling its sustainable timber yield is more difficult than with the alternatives that rely wholly on traditional forest management techniques. The level of confidence in the preceding numbers is therefore lower than the numbers for alternative A,B,D and E.

Management of OGEAs would include density management (intermediate harvests) to promote stand diversification and development of old-growth characteristics and to produce timber. In addition, regeneration harvests would mimic natural processes and produce timber. Regeneration harvests, which would be deferred for 80 years, would consist of small patch cuts (one to five acres) with six to ten trees per acre retained in the small openings, would retain snags where feasible and retain four down logs 24 inches in diameter and 50 feet long (where available) per acre. Regeneration harvests would be staggered through the stand with the overall stand cycle to be 300 years. Stand size would generally be 100 to 300 acres with one-fourth to one-third of the stand to receive a regeneration harvest every 50 to 100 years. No portion of the stand would be reduced to less than 35 percent of normal basal area (based on Technical Bulletin 201; Yield of Douglas-fir in the Pacific Northwest, McCardle, Meyer, Bruce, 1961) and on an overall stand basis, old-growth character would be retained. Regeneration harvests would be on a 300 year cycle.

The management of connectivity areas would include regeneration harvests that would retain 12 to 16 live trees per acre, retain snags where feasible, and retain where available four down logs 24 inches diameter and 50 feet long per acre. Regeneration harvests would be on a 150 year cycle. Objectives of the regeneration harvests would be to reestablish old-growth conditions and character at approximately 100 to 120 years and to produce timber. Long term objectives would be to maintain 20 to 30 percent of BLM-administered lands in the connectivity areas in a well distributed pattern of mature and old-growth seral stages. Management of connectivity areas would also include density management (intermediate harvests) to promote stand diversification and development of old-growth characteristics and to produce timber.

Management of the general forest management areas (GFMA) would include regeneration harvests that would retain six to eight live conifers per acre, retain snags where feasible, and retain where available four down logs 24inches in diameter and 50 feet long per acre. Regeneration harvest cycle would be based on the culmination of mean annual increment or approximately 80 to 110 years. A maximum of one commercial thinning and three fertilizations would be conducted to increase value and/or volume of harvested timber. Previously clearcut stands in the GFMA would have a minimum harvest age of 60years for the first rotation.

Regeneration harvests would be used to regenerate all indigenous tree species. This would be achieved through partial cutting, group selection, or a combination of these. Harvest unit configuration and size would be determined by on the ground conditions and management objectives such as minimizing fragmentation or cumulative impacts and enhancing biodiversity.

Harvest techniques that minimize impacts to soil and residual vegetation such as cable yarding, tractor yarding with designated skid trails or aerial yarding would be used. Where new roads are needed, road density would generally not exceed that needed if clearcut harvesting were planned. New roads would be constructed to the lowest practical standard and density consistent with resource protection and multiple use value. Road management, including closure, could be applied to meet biodiversity and multiple use needs.

Prescribed fire would be used as a favored tool for site preparation, fuel reduction and to restore natural ecological processes. Use of prescribed fire and the application and monitoring of herbicides would be done in accordance with BLM's "ROD, Western Oregon Program, Management of Competing Vegetation," 1991.

Natural regeneration following timber harvest would be encouraged in OGEAs and in connectivity areas, through silvicultural prescriptions, sale design, and reforestation planning. In the OGEAs and connectivity areas, natural reforestation would supplement artificial regeneration to minimize regeneration lag, but with wide spacing to delay crown closure. General forest management areas would be reforested by planting indigenous commercial species generally within one year of the completion of harvesting and site preparation. Practices would be similar to those intensive practices described in Timber Production Practices portion of Management Direction Common to All Alternatives section of this chapter. Planting stock of commercial species would be used including superior tree seed collected from wild trees or from seed orchards developed from wild trees. Up to 100 percent superior tree seed would be used in individual units in the GFMA and up to 50 percent superior tree seed would be used in individual units in OGEAs and connectivity areas. Mixed species would be used to assure diversity of regeneration.

Conversion of natural vegetation (e.g., hardwood) sites would not occur. Hardwood stands on conifer sites would be converted to conifer production, but would retain hardwoods in the reestablished stand.

In the OGEAs and connectivity areas, native hardwoods would be retained or restored as part of the forest mix, to enhance biodiversity and provide natural fertilization. Hardwoods would be artificially regenerated where natural propagation is not likely. The goal would be to retain or attain a hardwood component resembling that which occurred naturally. Fertilization would be used only where relevant to supplement natural nitrogen fixation, enhance growth and hasten development of structure and large trees. To the extent that stand conditions permit in the GFMA, connectivity areas, and OGEAs, harvests would leave enough snags and dead-and-down material to meet Old-Growth Definition Task Group standards (Pacific Northwest Research Station Note PNW-447, July 1986).

Special Status Species Habitat

Habitats of federally listed and proposed threatened or endangered species, federal candidate (Category 1 and 2), state listed, and Bureau sensitive species would be managed so that BLM would avoid contributing to the need to list such species. When it is considered biologically appropriate, special status species habitat would be buffered by 100-300 feet from all surface disturbance and harvest of timber. Field or office reviews would be conducted on all proposed actions. If populations of these species were found, then their habitats would be protected through modification of management actions as appropriate to avoid contributing to the need to list the species. (See Table 2-1)

Bald Eagle Habitat

The Umpqua River Corridor Habitat Management Plan for bald eagles would continue to be implemented. Delineated bald eagle habitat would not be considered for disposal. Acquisition of conservation easements or ownership of lands would be pursued within active or future occupied bald eagle territories. Priority would be placed on acquiring land adjacent to the Cougar Creek and Woodruff Mountain sites (approximately 200 acres). Site specific habitat management plans would be developed for all occupied nesting territories. A seasonal road closure would be implemented from February 15 to August 31 on 1.5 miles of road at the head of Huntley Creek to limit disturbance in an active nesting territory.

Peregrine Falcon Habitat

At present there are no known Peregrine falcon nesting sites on district BLM-administered land. Peregrine falcon nesting cliffs occupied in the future would have seasonal disturbance restrictions within 1/4-mile placed around them including mining and mineral leases. Occupied sites would be protected to maintain features important to peregrines. Pesticides which have a negative effect on prey species or their habitat would not be applied within two miles of active sites. Habitat management plans would be written for all active Peregrine falcon sites.

Northern Spotted Owl

In addition to an 80 year deferred harvest in the OGEAs, all known and newly discovered northern spotted owl pair sites in the connectivity areas and the GFMA would be protected by the reservation of an 80 to 100 acre area. Pair sites would be protected until monitoring showed that the sites are no longer in use or have the potential for use. At a minimum, it is expected that all pair sites would be protected for the life of this plan. Logging activity, road building and the use of other large power equipment that may adversely affect spotted owl nesting would be prohibited within 1/4-mile of all active spotted owl nest sites from March 1 to September 30.

Columbian White-tailed Deer

Timber harvest or other vegetation altering activities on all BLM-managed lands (6,161 acres) within the general area of distribution will only occur if determined beneficial to Columbian White-tailed deer or until such time that definitive information is available describing the use level and value of these lands in the context of meeting recovery plan goals. Acquisition of lands within the core area (primarily T. 26 S., and T. 27 S., R. 5 W.) for the Columbian white-tailed deer in Douglas County through exchange or purchase would be actively pursued. To provide long term recovery for the Columbian white-tailed deer, the recovery plan identifies a need for 5,500 acres of secure suitable habitat. An HMP would be prepared for existing BLM-managed lands detemined to be of significant value to Columbia white-tailed deer or any lands acquired specifically for this species .

Townsend's Big-eared Bat

Townsend's big-eared bat roosts and hibernacula would be protected and buffered by 600 feet to maintain the integrity of sites. Disturbance would be limited near roosts and hibernacula to prevent detrimental impact to colonies. The use of pesticides which are detrimental to prey species or their habitat within the normal hunting range of known bat nursery colonies and hibernacula would be restricted. The restriction would apply to an area within a two mile radius of roosts, nursery colonies, and hibernacula or until site specific monitoring proved otherwise. BLM would pursue acquisition of the Scott Mountain hibernaculum consisting of approximately 10 acres.

Other Wildlife Habitat

Wildlife Trees and Down logs

All soft snags would be retained consistent with safety standards, and where available, three hard snags per acre (larger than 20 inches dbh and 10 feet tall). Live trees would be retained as outlined in the Old-Growth and Mature Forest discussion of this chapter. The objective would be to retain as many snags and as much dead-and-down wood as possible. As a minimum, enough snags and dead-and-down wood would be retained to meet Old-growth Definition Task Group standards (Pacific Northwest Research Station Note PNW-447, July 1986.). These conditions would not be met if sufficient snags or dead-and-down wood are not available or if not practical for logging and site preparation considerations.

Roosevelt Elk Management

Elk habitat management would be emphasized in the Tyee, Camp Creek and Deadman Mountain elk areas. Habitat management plans would be developed or updated. The following closures would be implemented to limit the amount of vehicle access.

1. Approximately 20 miles of existing roads in the Tyee elk area.
2. Approximately 10 miles of year long road closure on existing roads in the Deadman Mountain elk management area to establish an area of approximately 6000 acres (at the head of Days and Coffee Creeks) with restricted disturbance.

Within OGEAs, existing or new spur roads not required for managment over the next ten years would be closed where road densities exceed 1.5 to 2.5 miles per square mile on BLM-administered lands.

In the Tyee, Camp Creek, and Rock Creek elk management areas outside of OGEAs, the following guidelines would be adopted for timber harvest units:

1. Thirty percent of the harvest units would be small units (15 to 20 acres) with irregular boundaries.
2. Within harvest units the distance to cover would not exceed 500 feet.
3. Minimum width of cover adjacent to harvest units would be 200 feet.

In cooperation with the ODFW, elk transplants would be conducted to supplement existing numbers and establish new herds in the Rock Creek, Little River, White Rock, and Green Butte elk areas.

The Tyee and Camp Creek elk management areas would be targeted for more balanced management of all elk habitat through blocking of public ownership of lands. These two management areas would be priority areas for increasing BLM-administered lands as exchange opportunities arise.

Wild Turkey Habitat

All oak stands would be maintained except on conifer sites within designated turkey habitat utilizing a variety of methods including prescribed fire. A minimum of one ten acre stand of roosting habitat would be provided in each section of designated turkey habitat. Roosting habitat would contain the following components:

- A scattering (8-10) of large (larger than 24" DBH) open limbed conifer trees on each acre.
- Ponderosa pine when available would be preferred roost trees.

Osprey Habitat

On BLM-administered lands within 1/4-mile of known osprey nest sites (2,500 total acres), nest trees and adjacent perch trees would be protected and disturbance would be restricted between March 20 and August 31. Adequate nest and perch replacement trees for osprey would be retained within 1/4-mile of nest sites.

Other Raptor Habitat

Known and future raptor nest sites not protected by other management recommendations would be protected by providing suitable habitat buffers and seasonal disturbance restrictions.

Special Habitat Areas

Special habitat areas would be buffered by 100 to 200 feet to protect their plant community structure, species composition, and ecological processes. The special habitat buffer would be an area designated and managed for the protection or enhancement of the special habitat. Activities such as timber harvest, timber salvage, and prescribed burning would be permitted within the buffers when they are considered necessary for special habitat restoration and would benefit resident special habitat species. Water courses flowing into and out of wetland habitats would be maintained.

Special Areas

Six existing Special Areas would be retained, four existing Special Areas would be expanded, and two new Special Areas would be designated. Total allocation would be 4,111 acres. See Table 2-5. The existing Brad's Creek and Golden Bar ACECs would be included in the new Umpqua Wildlife ACEC under this alternative. All ACEC/RNAs would be withdrawn from locatable mineral entry and would have a no surface occupancy stipulation for leasable minerals. The proposed Bushnell Irwin rocks ACEC/RNA would not be designated.

Recreation

Cow Creek Canyon would be managed as a Special Recreation Management Area.

Interpretive opportunities along the Cow Creek Backcountry Byway would be emphasized. Emphasis would also be put on recreational gold panning, camping, hiking, and other dispersed recreational opportunities in this SMRA.

All existing recreation sites and trails would be maintained and managed. See Table 2-3.

To develop the Hardscrabble, Riverview, and Island Creek potential recreation sites land acquisition would be pursued. This land acquisition would involve acquiring approximately 40 acres in two different ownerships located in Section 12, T. 22 S., R. 6 W., W.M., for the Hardscrabble site, and approximately 60 acres in Section 1, T. 31 S., R. 7 W., W.M. and Section 36, T. 30 S., R. 7 W., W.M. for the Island Creek site and approximately 131 acres in Section 32, T. 23 S., R. 7 W., W.M. for the Riverview site.

The following existing or potential Recreation sites would be proposed for withdrawal from locatable mineral entry or have their existing withdrawals expanded:

Riverview
Susan Creek Recreation Site
Recreational Gold Panning Area

North Umpqua Trail Primitive Campsite
Umpqua Boat Launch
Iron Mountain Gold Panning Area
Island Creek Recreation Site
Pickett Bridge Recreation Site

A total of 566 acres would be identified for withdrawal from public land and mineral law.

To retain options for future development of high-value potential recreation sites and facilities for dispersed recreation opportunities, no timber sales other than salvage sales of dead and dying timber would be made from 2,264 acres encompassing the following areas.

Potential Recreation Sites

North Umpqua Trail Primitive Campsite
South Bank Swiftwater Day Use
Susan Creek Group Reservation Campsite
Riverview
Camp Tyee
Umpqua Boat Launch
Hardscrabble Recreation Site
Island Creek Recreation Site
Weaver Road Pond
McNab Creek Pond
Michigan Springs
Brickyard Pond
Chimney Rock Pond
Lavadoure Boat Ramp
Red Top Pond
Iron Mountain Gold Panning Area
Hubbard Creek ORV Area
Pickett Bridge Recreation Site

Potential Trails

Cow Creek Bluffs
Cow Creek Trail
Deadman Mountain Trail
Rader-Wolf Creek Watchable Wildlife
Wolf Creek Falls Extention
Upper Susan Creek Falls Trail
Susan Creek Falls Barrier Free Trail
Tyee Mountain Trail

Potential SRMA

Cow Creek Canyon SRMA*

*Encompasses 1/4-mile each side of Cow Creek

An exception would be made in the event a natural disturbance (e.g., fire, windstorm) destroyed the high value recreation potential of the area.

Around man made ponds where helicopters may be dipping water for fire supression, trees would be cut when necessary to maintain open flyways to the pond.

Before Cow Creek Bluffs Trail and the Upper Susan Creek Falls Trail could be built, acquisition of access would be pursued across approximately 4,000 feet of private land.

There would be 19,500 acres and 90 miles of existing road closed either seasonally or year round to vehicle use other than for administrative purposes and commodity extraction. Areas currently closed to ORV use would continue to be closed. In addition, 5,102 acres of lands designated as ACECs and 374 acres of lands identified as containing special status plant species would also be closed to off road vehicle use. On all other BLM-administered land, ORV use would be restricted to open roads and trails and to those areas specifically identified for ORV use. The proposed Hubbard Creek ORV site would be one of these areas. ORV use will not be allowed on any designated hiking trails. See Table 2-1 for comparison of ORV restrictions. See Appendix 2-12 for comparison of road closures.

Wild and Scenic Rivers

The North Umpqua Wild and Scenic River Management Plan would be adopted as the land management document for those lands within the designated boundaries of the Wild and Scenic River corridor.

No additional river miles would be recommended suitable for Federal designation as part of the National Wild and Scenic River system.

Visual Resources

Available forest land where federal ownership consists of more than half of a viewshed and available forest land adjacent to (within 1/4-mile) developed recreation sites, state and federal highways, state scenic waterways, and rivers designated under the federal Wild and Scenic Rivers Act would be managed as inventoried. All other available forest land would be managed as VRM Class IV, except as noted under Rural Interface Area Management. The remaining lands would be managed as inventoried. Acres that would be managed for each VRM Class are shown in Table 2-1.

Land Tenure

Exchanges or acquisitions would be made to benefit any of the resources managed, however, O&C and CBWR lands would not be exchanged to acquire inholdings in OGEAs to enhance spotted owl habitat. As an matter of practice, substantial areas of O&C forest lands allocated as available for timber management would not be exchanged for lands to be managed for single use management purposes. Any exchanges involving O&C lands would be done in close consultation with the O&C counties. Sales of lands other than available commercial forest lands would be made to dispose of lands that meet criteria (1) or (2) of FLPMA Sec. 203(a), but sales of land that meet only criteria (3) would not be made. (See Land Tenure Management, Common to All Alternatives for explanation of criteria).

FLMPA leases of O&C and CBWR lands, other than commercial forest lands, and of public domain lands would be made to accomodate appropriate uses. Leases and conveyances under the Recreation and Public Purposes Act would be made in Zones 2 and 3 to provide appropriate facilities or services. Areas identified for acquisition and/or land withdrawal are identified in Special Area, Special Status Species, Wildlife Habitat Management and Recreation Management sections of this alternative.

Energy and Minerals

The majority of the mineral estate administered by the BLM would continue to be available for leasable minerals, open to location under mining laws and open to sale of salable minerals. See Tables 2-7, 2-8, and 2-9. Land reclamation would be in accordance with current BLM manual direction. Withdrawals totaling 2,143 acres would be proposed under this alternative for ACEC/RNAs and recreation sites. See Tables 2-5 and 2-3.

Rural Interface Areas

There are 8,552 acres of BLM-administered lands within 1/4-mile of private land in identified rural interface areas zoned by Douglas County for one to five acre lots which would be managed for VRM Class III objectives. The following alternative timber management practices would not be applied on those lands: herbicide spraying, clear cutting, and broadcast burning. Future oil and gas development within 1/4-mile of these areas would be allowed, but with no surface occupancy. See Table 2-1 for comparison of BLM-managed acres located within identified Rural Interface Areas by alternative.

Forest Road Construction.

Requirement for Further Environmental Analysis

Site-specific environmental analysis and documentation (including categorical exclusion or administrative determination where appropriate and RMP conformance determination) would be accomplished for each action or type of treatment under consideration. Where the action is to be accomplished by a contractor or timber sale purchaser, the environmental analysis is a primary means for determining appropriate contract stipulations. Where the action is to be accomplished by BLM personnel, the environmental analysis is a primary means for determining how it will be conducted.

Interdisciplinary impact analysis will be tiered within the framework of this and other applicable environmental impact statements. Tiering is used to prepare more specific documents without duplicating relevant parts of previously-prepared general documents. The more specific environmental analysis can not lead directly to a change in the decisions resulting from the more general environmental analysis to which it is tiered. It could, however, result in some interim management direction pending plan revision, or a proposal to amend the plan. If an environmental assessment indicates potential for significant impacts that are seriously different from those described in an existing EIS, an environmental impact statement or supplement to this or another EIS may be required.

Specific proposals for treatment to manage competing vegetation would be addressed in site-specific environmental analyses tiered to BLM's "EIS, Western Oregon Program: Management of Competing Vegetation", 1989. Specific proposals for control of noxious weeds would be addressed in site-specific environmental assessments tiered to BLM's "EIS, Northwest Area Noxious Weed Control Program", 1986, as supplemented in 1987.

Analysis of cumulative effects on water in the EIS for this RMP may guide overall activity scheduling during the life of the plan. Analysis of cumulative effects on water would be revisited when addressing project level activities, to incorporate the most current available information regarding recent and projected activities. Results would be compared to those identified in the EIS. If a proposed activity lies outside the analytical watersheds specifically addressed in this EIS, only a subdrainage analysis would normally be made.

Direct, indirect, and cumulative effects on water for project level activities would be analyzed for the appropriate size watershed. The analysis would determine whether implementation of standard BMPs are sufficient to comply with Oregon water quality standards. Proposed activities that appear likely to result in violation of these standards would be modified to mitigate the effects on water quality or deferred until it appears that activities could be conducted in compliance with the standards.

Environmental assessments will be made available for public review in one of the following ways:

Use of the Completed Plan

The BLM planning regulations (43 CFR 1610.4-9) call for monitoring and evaluating Resource Management Plans at appropriate intervals. The purposes of monitoring the RMP are to:

1. Be sure activities are occuring in conformance with the plan.
2. Determine if activities are producing the expected results.
3. Determine if activities are causing the effects identified in the EIS.

The proposed monitoring plan for the RMP is set forth in Appendix 2-13.

Figure 2-1 shows how monitoring could lead to a revision in design features or to other changes in the RMP.

After implementation of the selected plan, it is expected to be at least a year before substantial on-the-ground activity under its guidelines will occur, due to the lag in time for BLM project implementation and for actual activity to start on timber sales sold under the plan. In addition to routine monitoring, formal evaluation of the Resource Management Plan will be conducted shortly after the end of both the third and the fifth year it is in effect, to determine whether there is significant cause to amend or revise it. Evaluation includes a cumulative analysis of monitoring records, with the broader purpose of determining if the plan's goals and objectives are being met, and whether the goals and objectives were correct and achievable in the first place. Among the specific criteria to be considered in these evaluations are the following:

- Have average annual acres of intensive management practices or average annual timber sale volume deviated from that expected in the plan to such a degree that a deviation of more than ten percent in programmed sale volume for any sustained yield unit (SYU) for the expected ten-year life of the plan is anticipated? (Ten percent is defined as the threshold for revision because it represents the approximate accuracy of the timber inventory data used in the allowable sale quantity calculation.)

- Is reforestation occurring approximately as planned, or is a backlog developing of such magnitude that an allowable sale quantity change of more than ten percent would be appropriate if the trend were expected to continue for the balance of the ten-year period?
- Have Timber Production Capability Classification (TPCC) acreage shifts made during timber sale planning led to a net change that would modify the allowable sale quantity for any SYU by more than ten percent?
- Do the combined effects of any changes identified above indicate that the allowable sale quantity should be modified by more than ten percent?
- Have changed circumstances (including new information) shown that some of the plan's goals and objectives are unlikely to be met?
- Have changed circumstances (including new information or changes in the plans of other government agencies or Indian tribes) so altered the amount or method of timber harvest or the expected impacts (on water, wildlife, etc.) of harvest or other activities, that the environmental consequences of the selected alternative may paint a seriously different picture than those anticipated in the RMP/EIS?

Determination of where parameters of expected environmental consequences seriously differ will be linked to thresholds related both to the reliability of relevant predictions and to the significance of the particular environmental consequences.

If the answer to any of the preceding questions is affirmative, a plan amendment or revision may be considered. An analysis will be prepared and, if amending the plan is appropriate, the amendment process set forth in 43 CFR 1610.5-5 or 1610.5-6 would be followed. If amendment is not appropriate, it may still be necessary to supplement the EIS.

No additional evaluations of this type would be done unless some changed circumstance or unusual event called the continuing validity of the plan into question. Evaluations would not be conducted after the start (publication of a Notice of Intent to revise the Plan/EIS) of the next scheduled plan revision (on a 10-year cycle). Following completion of each plan evaluation, a summary of its findings will be included in the district's annual program summary.

If, too late for consideration in the fifth-year evaluation of the plan, some changed circumstance or unusual event calls the continuing validity of some aspect of the plan into question, interim management adjustments may be made without a plan amendment, to meet the plan's goals and objectives. The kind of circumstance which could lead to such an adjustment might be an announcement of research findings which clearly establish that some of the plans goals and objectives are unlikely to be met. The kind of unusual event which could lead to such an adjustment might be a major catastrophe such as a wildfire or windstorm causing extensive damage to forest stands. Similar interim adjustments can be made during the first five years of the plan, pending evaluation and possible plan amendment.

This approach to evaluation and interim adjustment will provide a process of adaptive management, permitting effective response to changing knowledge. Adaptive management could entail modification of silvicultural prescriptions to respond to increasing knowledge providing greater certainty about anticipated climate change or to respond to increasing knowledge about the habitat needs of spotted owls, to cite two examples that could have widespread application. It could equally entail modification of rather localized management practices to respond to the results of monitoring. Although applicable to all alternatives, adaptive management would be particularly pertinent to alternative C which includes many elements that are substantially untested.

Potential new management actions which are identified after RMP/ROD approval would be reviewed before BLM takes any actions. For example, if a new ACEC proposal meets BLM criteria for consideration, the District Manager may prescribe interim management measures for the balance of the life of the plan. Such interim management must meet the objectives of the RMP, except where they are inconsistent with the regulations regarding potential ACECs, and would become subject to analysis in the next RMP process.

The result of cumulative effects analysis by subdrainage in timber sale environmental analyses would influence final decisions both on timber sale scheduling and on application of design features and mitigating measures, including Best Management Practices (BMP) for water quality protection. Monitoring and evaluating the effectiveness of BMPs is required by Oregon's nonpoint source management plan to ensure that water quality standards are achieved and that beneficial uses are maintained. When monitoring identifies unanticipated impacts, the information gained from that monitoring will be used in subsequent development of mitigating measures, including BMPs, and considered in analyses of cumulative effects.

Factored into these timber sale scheduling decisions where appropriate would be an assessment of compliance with the anti-degradation policy of Oregon's Water Quality Standards (OAR 340-41-026(1)(a). These standards apply to existing high quality waters which exceed those levels necessary to support propagation of fish, shellfish, and wildlife and recreation on the water.

Proposed timber sales and other land disturbing activities will incorporate the iterative (adaptive management) process for developing, implementing and evaluating nonpoint control (Best Management Practices) to determine if water quality goals have been met. Modification of nonpoint source controls, including BMPs, will be adjusted based upon sound scientific evidence. Where necessary appropriate actions to mitigate effects on water quality will be taken to protect designated beneficial uses.

The Allowable Sale Quantity (ASQ) identified in the plan represents the maximum annual average timber sale volume that would be offered from lands allocated to planned timber harvest. This volume of timber is considered sustainable over the long term based on the assumptions that the available land base remains fixed, and that funding is sufficient to make planned investments in timely reforestation, plantation maintenance, thinning, genetic improvement, forest fertilization, timber sale planning, and related forest resource protection.

Timber sale volumes and associated programs will be reduced if annual funding is not sufficient to support the relevant actions assumed in the plan, including mitigation and monitoring. The extent of the reduction will be based on the principle of program balance as envisioned in the plan. For example, if funding in a given year is sufficient only to support half of planned annual investments in fertilization, the timber sale volume for that year would be reduced by half of the portion of the ASQ attributable to planned fertilization. If, in subsequent years, budget levels permit BLM to eliminate the backlog of unfunded investments that have accumulated, the timber sale volume will be adjusted upward to the extent that benefits from the investments can be quantified.

This principle will apply similarly to management of roads and recreation sites. If maintenance of such facilities is not adequately funded, some of them may be closed to scale back management commitments to the level that is budgeted.

Costs of Management

The costs of implementing the alternatives would vary, primarily according to the complexity of managment proposed and the amount of timber that would be offered for sale.

Those alternatives that propose mostly traditional timber management approaches (NA, A, B, D, E), even though they allocate widely variable acreage for that purpose, would entail timber management costs essentially proportional to the proposed timber sale volume. These would be consistent with past management costs for this purpose. The alternatives that exclude the most lands from timber harvest would tend to increase costs per unit of timber sold, as necessary road investments and maintenance costs would be prorated against less volume. Countervailing savings may occur, however, as the more restrictive alternatives tend to leave available for timber harvest mostly those lands requiring the least costly mitigation in design of timber harvest prescriptions.

In contrast, the costs of nontraditional timber management as proposed in the preferred alternative and alternative C would be much higher per unit of timber sold than for the other alternatives. Preliminary cost estimates based on research at Oregon State University (OSU) indicate management costs associated with the preferred alternative could increase two to five times over traditional management. These additional costs include practices that provide noneconomic benefits such as management of biological diversity and special status species habitat.

For most other programs, the costs of management would not vary substantially ammong the alternatives. The programs for which substantial variation is expected are:

> Recreation: Development of new sites in alternatives D, E, and PA, if funded through the budget process, would entail large initial investments plus increased maintenance costs.
>
> Roads: The costs of construction and maintenatnce of roads in support of timber management were addressed earlier. Some alternatives, in addition, involve substantial costs for closure of roads. These costs would be greatest under alternatives D and E but also substantial under alternatives C and PA.
>
> Wildlife: In those alternatives with non-traditional management and/or relatively low timber harvests, opportunities for elk forage seeding would be less. Thus, less would be invested in such seeding in alternatives C, D, E, and PA than in the other alternatives.

Management of Newly Acquired Lands

Lands may come under BLM administration after completion of the RMP/ROD through exchange, donation, purchase, revocation of withdrawals of other federal agencies, or relinquishment of Recreation and Public Purpose Act leases. Newly acquired lands or interests in lands would be managed for their highest potential or for the purposes for which they are acquired. For example, lands acquired within "special management areas" with Congressional or RMP allocation/direction will be managed in conformance with guidelines for those areas. If lands with unique or fragile resource values are acquired, it may be appropriate to protect those values until the next plan revision.

Lands acquired with no identified special values or management goals would be managed in the same manner as comparable BLM lands. This implies typical timber harvest opportunities, intensive timber management practices, management of the mineral estate, standard operating procedures and pre-committed mitigation measures. Exchanges of lands resulting in net adjustments in the commercial forest land base may be made without adjusting the allowable sale quantity or amending the RMP, unless the cumulative effects of all changes identified since approval of the RMP/ROD indicate that the decadal allowable sale quantity for any SYU should be modified by more than 10 percent.

Monitoring the Resource Management Plan

The implementation of the RMP will be monitored during the life of the plan to ensure that management actions are being implemented and are meeting their intended purposes. Specific management actions arising from proposed activity plan decisions will be compared with RMP objectives to ensure consistency with the intent of the plan. The draft monitoring plan for the preferred alternative is set forth in Appendix 2-13.

Research

One of the identified purposes of monitoring, to determine if activities are causing the effects expected, can only be answered by structured research. Over the past decade, the Forestry Intensified Research (FIR) program and other work funded by the National Science Foundation and other organizations have developed significant new knowledge about the ecosystems of western Oregon, the habitat requirements of wildlife species, and the effectiveness of practices used to manage those ecosystems for a variety of objectives.

Additional research is underway. Research includes a BLM funded project to improve knowledge about spotted owl habitats and the development of sivicultural systems for management of such habitat; a study aimed a prediction of mortality levels in young stands subject to various levels of competition; cooperation with the Stand Management Cooperative of the University of Washington; and continued cooperation with the Wildlife Ecology Team of the Pacific Northwest Research Station in performing wildlife habitat relationship studies.

BLM staff is involved in continuing the plant association classification and correlation work begun under the FIR program. In that effort, emphasis will be placed on development of sudies that permit better understanding of ecosystem processes and relationships within the major plant communities of western Oregon.

An overall strategy for forest managment over the next decade would allow operational treatments to be carried out within a research design, which could in turn result in modification to operations during the next planning cycle, or earlier if appropriate. This strategy of adaptive managment could consist of an ongoin interplay between modeling, experimentation, and management actions and could create new models for biological diversity based management.

In addition to adaptive management BLM has identified a number of specific information needs that can only be addressed by specifically designed new research porjects. Appendix 2-15 contains a list of such research topics for which BLM proposes to seek funding. The research would be intended to develop new information to assist future decisions, particularly those to be made in the planning cycle. The list of possible research topics is considered dynamic, and it is anticipated the list will be modified after completion of this RMP to reflect evolving knowledge and priorities.

Summary of Impacts

A summary of impacts of the alternatives has been set forth in Table S-2, incorporated into the Summary at the front of this document.

Table 2-1. Comparisons of Allocations and Management by Alternative[1]

Allocation/Management Actions by Alternative	No Action	A	B	C	D	E	Preferred
Water Quality and Riparian Zones							
Riparian Management Area (RMA)							
Protection (Average width in feet each side of stream)[2]							
Stream Order: 1						50	[3]
2					60	60	[3]
3	100	75	75	105	140	200	105[3]
4	100	75	100	150	200	200	150
5	100	75	140	210	280	280	210
6+	100	75	160	240	320	320	240
Lakes, ponds, & other waters		75	100	150	200	400	150
RMA (acres)	18,300	16,886	18,220	29,308	52,282	61,764	34,576
Fragile soil area protection							
Areas excluded from harvest or other ground disturbing activities (acres) {i.e. FGR acres in alt E}	0	0	0	0	0	105,577	0

Table 2-1. Comparisons of Allocations and Management by Alternative[1] (cont.)

Allocation/Management Actions by Alternative	No Action	A	B	C	D	E	Preferred
Old Growth and Mature Forest Habitat							
Management Direction			Contribute to habitat diversity and old growth in a corridor system with blocks of 640 acres connected by 80-acre stepping-stone blocks.	Manage for retention and improvement of biological diversity maintaining 16 percent of the land in restoration and retention blocks.	Manage as recommended by the 1990 Conservation Strategy for the northern spotted owl.	Contribute to habitat diversity by protecting existing stands over 150 years old, suitable spotted owl habitat within two miles of each spotted owl site and additional habitat to benefit amphibians and pileated woodpeckers.	Manage 29% of the land as an old growth emphasis area. Manage 16% of land as connectivity area for old growth associated species.
Areas managed for retention & development of older forest (acres) [all forest land not available for timber mgmt would be counted here i.e. RMAs, ACECs etc]	0	0	30,400	77,900	133,400	343,700	144,600
Area managed for maintenance of older forest characteristics (acres)	35,900	0	0	270,200	0	0	66,400
Old-Growth Retained	42,800*	13,900	31,100	48,200	73,400	115,500	61,200

Table 2-1. Comparisons of Allocations and Management by Alternative[1] (cont.)

Allocation/Management Actions by Alternative	No Action	A	B	C	D	E	Preferred
Timber							
Forest Management Allocations (acres):							
Intensive	331,600	353,300	318,900	0	0	23,900	144,300
Restricted	35,900	0	2,400	270,200	207,200	23,400	188,300
Woodlands	NA	2,900	2,600	*	0	0	0
Enhancement of Other Uses or Not Available	34,400	39,400	71,600	125,300	188,400	348,200	63,000
Practices (assumed average annual acres for first decade):							
Regeneration Harvest	57,000	74,000	66,600	32,400	18,900	6,700	32,200
Woodlands Regeneration Harvest	NA	600	500	*	0	0	0
Commercial thinning /density mgmt. harvest	1400/0	1700/0	1600/0	1100/4300	1000	*	1300/5100
Site Preparation	44,500	30,000	30,000	24,300	10,400	5,000	24,200
Prescribed Fire	4,000	3,700	3,300	1,600	700	300	1,600
Other							
Stand Maintenance/Protection	70,800	49,600	44,600	21,700	9,300	4,500	21,600
Release/Pre-commercial Thinning	40,400	60,500	55,100	43,500	32,400	7,800	52,800
Brushfield/Hardwood Conversion	0	600	500	0	300	100	500
Planting/Regular Stock	52,300	54,100	45,200	19,400	3,300	5,400	3,900
Planting/Genetically Selected Stock	15,200	34,700	34,700	19,400	13,300	2,700	34,700
Fertilization	55,600	62,300	57,600	47,300	36,300	8,300	58,200
New road construction	500/2727	500/2727	450/2455	190/1036	190/1036	35/1912	15/1173

Table 2-1. Comparisons of Allocations and Management by Alternative[1] (cont.)

Allocation/Management Actions by Alternative	No Action	A	B	C	D	E	Preferred
Allowable Sale Quantity (MMCF)	40.5	47.7	44.0	11.2	14.3	3.2	16.3
Allowable Sale Quantity (MMBF)	247	315	291	74	92	18	105
Special Status Species Including Threatened and Endangered Species Habitat							
Management Direction	Manage habitats of Federal candidate, State listed and Bureau sensitive species on all BLM administered lands.	Protect habitats of Federal candidate, State listed and Bureau sensitive species where such mitigation would not diminish commercial use.	Same as A plus protect those habitats on public domain lands.	Same as B plus additional protection provided by management for older forests.	Protect habitats of Federal candidate, State listed and Bureau sensitive species on all BLM administered lands.	Same as D.	Manage habitats of Federal candidate, State listed and Bureau sensitive species on all BLM administered lands.
Areas managed for all Category 1 and 2 Federal candidate, State listed and Bureau sensitive species	423,896	62,806	113,325	116,965	419,074	419,074	419,373
Wildlife (Including Fisheries) Habitat							
Buffer width, special habitat areas (feet)	0	0	0	100-200	100-300	100-300	100-200
Fish habitat improvement (miles)	25	25	25	25	25	25	25

Table 2-1. Comparisons of Allocations and Management by Alternative[1] (cont.)

Allocation/Management Actions by Alternative	No Action	A	B	C	D	E	Preferred
Special Areas							
Existing RNA/ACECs retained (#/acres)	4/613	1/170	4/613	4/613	4/613	4/613	4/613
Other Existing ACECs retained (#/acres)	4/1855	0	3/1840	3/1840	1/1840	1/1840	1/1840
New RNA/ACECs designated (#/acres)	0	0	1/793	3/1922	3/1922	3/1922	2/964
Other new ACECs designated (#/acres)	0	0	0	0	1/727	1/727	1/727
Environmental Education Areas (#/acres)	1/85	0	0	0	0	0	0
Total RNA/ACECs (#/acres)	**4/613**	**1/170**	**5/1406**	**7/2535**	**7/2535**	**7/2535**	**6/1577**
Total other ACECs (#/acres)	**4/1855**	**0**	**3/1840**	**3/1840**	**2/2567**	**2/2567**	**2/2567**
Recreation Resources							
Recreation sites							
Existing (# sites/acres)	11/1135	11/1135	11/1135	11/1135	11/1135	11/1135	11/1135
New (# sites/acres)	7/85	0/0	3/65	7/107	18/285	18/285	18/285
Trails maintained							
Existing (# trails/miles)	6/13.5	6/13.5	6/13.5	6/13.5	6/13.5	6/13.5	6/13.5
New (# trails/miles)	3/4.5	0/0	0/0	4/4.5	7/10	7/10	7/10
Special Recreation Management Areas							
Existing (#/acres)	1/1620	1/1620	1/1620	1/1620	1/1620	1/1620	1/1620
New (#/acres)	1/1540	0/0	0/0	1/1540	1/1540	1/1540	1/1540
Backcountry Byways (#/miles)	4/89	4/89	4/89	4/89	4/89	4/89	4/89

Table 2-1. Comparisons of Allocations and Management by Alternative[1] (cont.)

Allocation/Management Actions by Alternative	No Action	A	B	C	D	E	Preferred
Acres open to ORV use	409,670	409,670	407,234	405,935	405,004	405,004	405,004
Acres limited to ORV use	0	0	0	0	117,935	414,659	414,659
Acres closed to ORV use	10,465	10,465	12,901	14,200	15,131	15,131	15,131
Wild and Scenic Rivers							
River segments found suitable for designation:							
As Recreational (#/miles)	0	0	0	0	0	185	0
As Scenic (#/miles)	0	0	0	0	0	0	0
As Wild (#/miles)	0	0	0	0	0	0	0
Visual Resources		Manage available forestlands as VRM Class IV and all other lands as inventoried.	Manage available forestlands as inventoried within 1/4 mile of recreation sites, State and Federal highways and designated rivers. Manage other available forestland as VRM class IV. Manage all other lands as inventoried.	Same as A except on available forestland where BLM- administered land is more than half of a viewshed, management as inventoried.	Manage all lands as inventoried.	Same as D except manage as VRM Class III all lands inventoried as Class IV, and manage as Class I all lands within 1/4 mile of recreation sites, State and Federal highways and designated rivers.	Same as A except on available forestland where BLM-administered land is more than half of a viewshed, managment as inventoried.

Table 2-1. Comparisons of Allocations and Management by Alternative[1] (cont.)

Allocation/Management Actions by Alternative	No Action	A	B	C	D	E	Preferred
Acres managed VRM Class I	30	25	25	25	0	6,311	25
Acres managed VRM Class II	9,300	15,176	30,194	43,514	86,779	141,887	38,348
Acres managed VRM Class III	13,600	2,005	6,681	7,189	22,855	271,937	6,224
Acres managed VRM Class IV	401,070	402,929	383,235	369,403	310,501	0	375,538
Land Tenure							
		Make exchanges to enhance nondeclining timber harvest level on BLM administered land. Sell or lease no commercial timberland.	Make exchanges of O&C and CBWR lands emphasizing opportunities primarily to enhance timber management opportunities. Sell public domain lands and O&C lands other than available commercial forestlands, meeting criteria of FLPMA Sec. 203(a). Makes leases to accommodate other appropriate uses.	Same as B except also make exchanges to contribute to conservation of biological diversity.	Emphasize exchanges to acquire lands with nontimber values. Sell lands other than available commercial forestlands, meeting criteria (1) or (2) of FLPMA Sec. 203(a). Lease only under the Recreation and Public Purpose Act.	Same as D.	Exchanges or acquisitions would be made to benefit any of the resources managed.

Table 2-1. Comparisons of Allocations and Management by Alternative[1] (cont.)

Allocation/Management Actions by Alternative	No Action	A	B	C	D	E	Preferred
Acres identified for retention (Zone 1)	422,857	35,930	35,930	35,930	35,930	35,930	35,930
Acres potentially eligible for exchange (Zone 2)	0	374,168	374,168	374,168	374,168	374,168	374,168
Acres potentially eligible for sale or exchange (Zone 3)	1,071	13,830	13,830	13,830	13,830	13,830	13,830
Rights-of-Way							
Rights-of-way Exclusion Areas (acres)	713	195	1406	2535	2535	8846	1577
Energy and Mineral Management							
Acres available for oil and gas and geothermal leasing	421,062	421,062	421,062	421,062	421,062	421,062	421,062
Acres closed to oil, gas and geothermal lease	28	28	28	28	28	28	28
Acres open to mining claim location and operation	416,162	416,960	415,674	414,500	414,323	412,951	414,323
Acres closed to mining location	3,211	2,413	3,699	4,873	5,050	6,422	5,050

Table 2-1. Comparisons of Allocations and Management by Alternative[1] (cont.)

Allocation/Management Actions by Alternative	No Action	A	B	C	D	E	Preferred
Rural Interface Area Management							
Acres considered for alternative management practices	0	0	8,552	8,552	8,552	24,052	8,552
Acres where clear cutting, herbicide spraying and prescribed burning excluded	0	0	0	0	8,552	24,052	8,552
Acres managed for VRM Class II objectives	0	0	0	0	8,552	24,052	
Acres managed for VRM Class III objectives	0	0	8,552	8,552	0	08,552	

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[1] See narrative for management direction common to all alternatives.
[2] Order 1 and 2 perennial stream would have a 75-foot RMA.
[3] Order 1, 2, and 3 fish-bearing streams would have a 150-foot RMA.
*Less than 100 acres.

Table 2-2. Proposed Fish Habitat Enhancement Projects.

Priority	Stream	Project Type
1	Wolf Creek (Tyee)	S,R,C,P,M
1	Rader Creek	S,R,C
1	Little Wolf Creek	S,R,C,P
1	Case Knife Creek	S,R
1	Boulder Creek	S,R,M
1	Stouts Creek	S,R,C,M
1	Shively Creek	S,R,M
1	East Fork Shively Creek	S,R
1	Pass Creek	S,R,M
1	East Pass Creek	S,R
2	South Fork Smith River	S,R,C
2	Little South Fork Smith River	S,R,C
2	Yellow Creek	S,R,C
2	Olalla Creek	S,R
2	Thompson Creek	S,R
2	Deadman Creek	S,R
2	Middle Fork Deadman Creek	S,R
2	Lee's Creek	P
2	Slide Creek	P
2	Cavitt Creek	S,R,P
2	Canton Creek	S,R
3	Upper Smith River	S,R,C
3	Martin Creek (Drain)	S,R
3	Fate Creek	S,R
3	Days Creek	S,R
3	Dompier Creek	S,R
3	Union Creek	S,R
3	Martin Creek (Dillard)	S,R

S=Structures
R=Rearing Habitat
P=Passage
C=Riparian Conversion
M=Monitoring

Table 2-3. Potential and Existing Recreation Sites and Trails.

	Alternatives						
	NA	**A**	**B**	**C**	**D**	**E**	**PA**
Existing Rec Sites							
Susan Creek Recreation Site**	Y	Y	Y	Y	Y	Y	Y
Mill Pond Recreation Site	Y	Y	Y	Y	Y	Y	Y
Rock Creek Recreation Site	Y	Y	Y	Y	Y	Y	Y
Scaredman Campground	Y	Y	Y	Y	Y	Y	Y
Cavitt Creek Recreation Site	Y	Y	Y	Y	Y	Y	Y
North Bank Swiftwater	Y	Y	Y	Y	Y	Y	Y
Tyee Rec Site	Y	Y	Y	Y	Y	Y	Y
Gunter Wayside	Y	Y	Y	Y	Y	Y	Y
Recreational Gold Pan Area**	Y	Y	Y	Y	Y	Y	Y
Lone Rock Boat Launch	Y	Y	Y	Y	Y	Y	Y
E-Mile	Y	Y	Y	Y	Y	Y	Y
Potential Rec Sites							
North Umpqua Trail Primitive Campsite**	Y	N	N	Y	Y	Y	Y
South Bank Swiftwater day use	Y	N	N	Y	Y	Y	Y
Susan Creek Group Reservation Camp	Y	N	N	N	Y	Y	Y
Riverview**	N	N	N	Y	Y	Y	Y
Camp Tyee	N	N	N	N	Y	Y	Y
Umpqua Boat Launch**	Y	N	Y	Y	Y	Y	Y
Hardscrabble Recreation Site+	N	N	Y	Y	Y	Y	Y
Island Creek Recreation Site** +	Y	N	N	N	Y	Y	Y
Weaver Road Pond	Y	N	N	N	Y	Y	Y
McNab Creek Pond	N	N	N	N	Y	Y	Y
Michigan Springs	N	N	N	N	Y	Y	Y
Brickyard Pond	N	N	N	N	Y	Y	Y
Chimney Rock Pond	N	N	N	N	Y	Y	Y
Pickett Bridge Recreation Site**	N	N	N	N	Y	Y	Y
Lavadoure Boat Ramp	N	N	N	N	Y	Y	Y
Red Top Pond	N	N	N	N	Y	Y	Y
Iron Mountain Gold Panning**	Y	N	Y	Y	Y	Y	Y
Hubbard Creek ORV Area	N	N	N	N	Y	Y	Y

Table 2-3. Potential and Existing Recreation Sites and Trails (cont.)

	Alternatives.						
	NA	A	B	C	D	E	PA
Existing Trails							
North Umpqua Trail	Y	Y	Y	Y	Y	Y	Y
Susan Creek Falls Trail	Y	Y	Y	Y	Y	Y	Y
Wolf Creek Falls Trail	Y	Y	Y	Y	Y	Y	Y
Susan Creek Campground Trail**	Y	Y	Y	Y	Y	Y	Y
Deadline Falls Watchable WL	Y	Y	Y	Y	Y	Y	Y
Camp Tyee Trail	Y	Y	Y	Y	Y	Y	Y
Potential Trails							
Cow Creek Bluffs	N	N	N	N	Y	Y	Y
Cow Creek Trail	Y	N	N	N	Y	Y	Y
Deadman Mountain Trail	N	N	N	Y	Y	Y	Y
Radar-Wolf Creek Watchable WL	Y	N	N	Y	Y	Y	Y
Wolf Creek Falls Extension	N	N	N	Y	Y	Y	Y
Upper Susan Creek Falls Trail	N	N	N	N	Y	Y	Y
Susan Creek Falls Barrier Free Trail	Y	N	N	Y	Y	Y	Y
Tyee Mountain Trail	N	N	N	Y	Y	Y	Y
Potential SRMA							
Cow Creek Canyon SRMA	Y	N	N	Y	Y	Y	Y

+ Land acquisition needed.
**Withdrawal from public land and mineral law.
Y = Yes, N = No

Table 2-4. Classifications and Withdrawals Recommended for Termination or Revocation.

Case No.	Withdrawing Agency	Original Purpose	Rationale for Termination Revocation
OR 05564	BLM	Small Tract Act Classification	Land is now leased under Sec. 302 of the FLPMA of 1976.
OR 010044	BLM	Recreation and Public Purpose	Lease terminated
OR 011654	BLM	Small Tract Act	Lease terminated Classification
OR 16775	BLM	Small Tract Act Classification	Land is now leased under Sec. 302 of the FLPMA of 1976

Table 2-5. Proposed Land Allocations (acres) for Special Areas.

			Proposed Allocation						
Special Area	Current Designation	Proposed Designation	NA	A	B	C	D	E	PA
Bear Gulch	None	ACEC/RNA	0	0	0	330	330	330	330
Beatty Creek	RNA	ACEC/RNA	173	0	173	331	331	331	331
Brad's Creek*	ACEC	ACEC	127	0	127	127	0*	0*	0
Bushnell Irwin Rocks	None	ACEC/RNA	0	0	683	958	958	958	0
Golden Bar*	ACEC	ACEC	93	0	93	93	0*	0*	0
Little River Arch	ONA	NONE	15	0	0	0	0	0	0
Myrtle Island	RNA	ACEC/RNA	30	0	30	30	30	30	30
North Myrtle Creek	ACEC/RNA	ACEC/RNA	240	0	240	472	472	472	472
North Umpqua River	ACEC	ACEC	1620	0	1620	1620	1620	1620	1620
Red Pond	EEA	ACEC/RNA	85	0	0	134	134	134	134
Tater Hill	ACEC/RNA	ACEC/RNA	170	170	280	280	280	280	280
Umpqua River Wildlife Area	None	ACEC	0	0	0	0	947	947	947
TOTAL			**2553**	**170**	**3246**	**4375**	**5102**	**5102**	**4144**

*Acreage included in the Umpqua River Wildlife Area ACEC

Table 2-6. Acres of Protected Special Status Plant Habitat and Buffers by Alternative.

		Alternatives						
Species	**Category**	**NA**	**A**	**B**	**C**	**D**	**E**	**PA**
Allium bolanderi	AS	0	0	0	0	46	46	46
Astragalus umbraticus	AS	0	0	0	27	30	30	30
Bensoniella oregana	FC	1	0	0	0	1	1	1
Calochortus coxii	FC	69	6	9	9	69	69	69
Calochortus umpquaensis	FC/SE	123	38	38	38	123	123	123
Horkelia conqesta ssp. congesta	BS	3	3	3	3	3	3	3
Limnanthes gracilis var. gracilis	BS	2	2	2	2	2	2	2
Mimulus douglasii	AS	0	47	47	47	47	47	47
Mimulus kelloggii	AS	0	5	5	5	5	5	5
Polystichum californicum	AS	0	1	1	2	11	11	11
Romanzoffia thompsonii	BS	28	28	28	28	28	28	28
Wolffia punctata	AS	9	9	9	9	9	9	9
Total Habitat Acres		**235**	**139**	**142**	**170**	**374**	**374**	**374**
Total Habitat Acres-Percent		**63**	**37**	**38**	**45**	**100**	**100**	**100**
Total Buffer Acres		**0**	**0**	**18**	**60**	**332**	**812**	**812**

AS = Assessment Species
BS = Bureau Sensitive
FC = Federal Candidate
SE = State Endangered

Table 2-7. Oil and Gas and Geothermal Lease Restrictions (acres)[1].

Restriction	NA	A	B	C	D	E	PA
Closed - Nondiscretionary	28	28	28	28	28	28	28
Closed - Discretionary	0	0	0	0	0	0	0
Open - No Surface Occupancy	8,078	5,709	8,785	9,914	10,641	10,641	9,683
Open - With Standard Lease Terms	388,946	378,949	367,373	351,195	159,775	252,735	356,329
Open - With Additional Restrictions	22,321	34,741	43,187	58,236	248,929	155,969	53,333

[1] Total acres include 1,717 acres of split estate.

Table 2-8. Locatable Mineral Restrictions (acres).

Restriction	NA	A	B	C	D	E	PA
Closed - Nondiscretionary	294	294	294	294	294	294	294
Closed - Discretionary	2,916	2,119	3,405	4,579	4,751	6,128	4,751
Open - Standard Requirements	395,349	396,226	394,720	393,546	366,247	391,270	366,247
Open - With Additional Restrictions	20,814	20,814	20,814	20,814	48,076	21,681	20,814

Table 2-9. Salable Mineral Restrictions (acres)[1].

Restriction	NA	A	B	C	D	E	PA
Closed - Nondiscretionary	28	28	28	28	28	28	28
Closed - Discretionary[2]	6,689	4,446	7,522	8,615	9,378	9,378	8,387
Open - Standard Requirements	407,436	409,679	406,603	405,474	380,747	404,747	381,738
Open - With Additional Restrictions[3]	5,218	5,218	5,218	5,218	29,218	5,218	29,218

[1] Total acres include 1,717 acres of split estate.
[2] Withdrawals, ACECs, cultural sites, areas suitable for designation as a recreational river.
[3] Time restrictions within 1/4-mile of any migratory bird site.

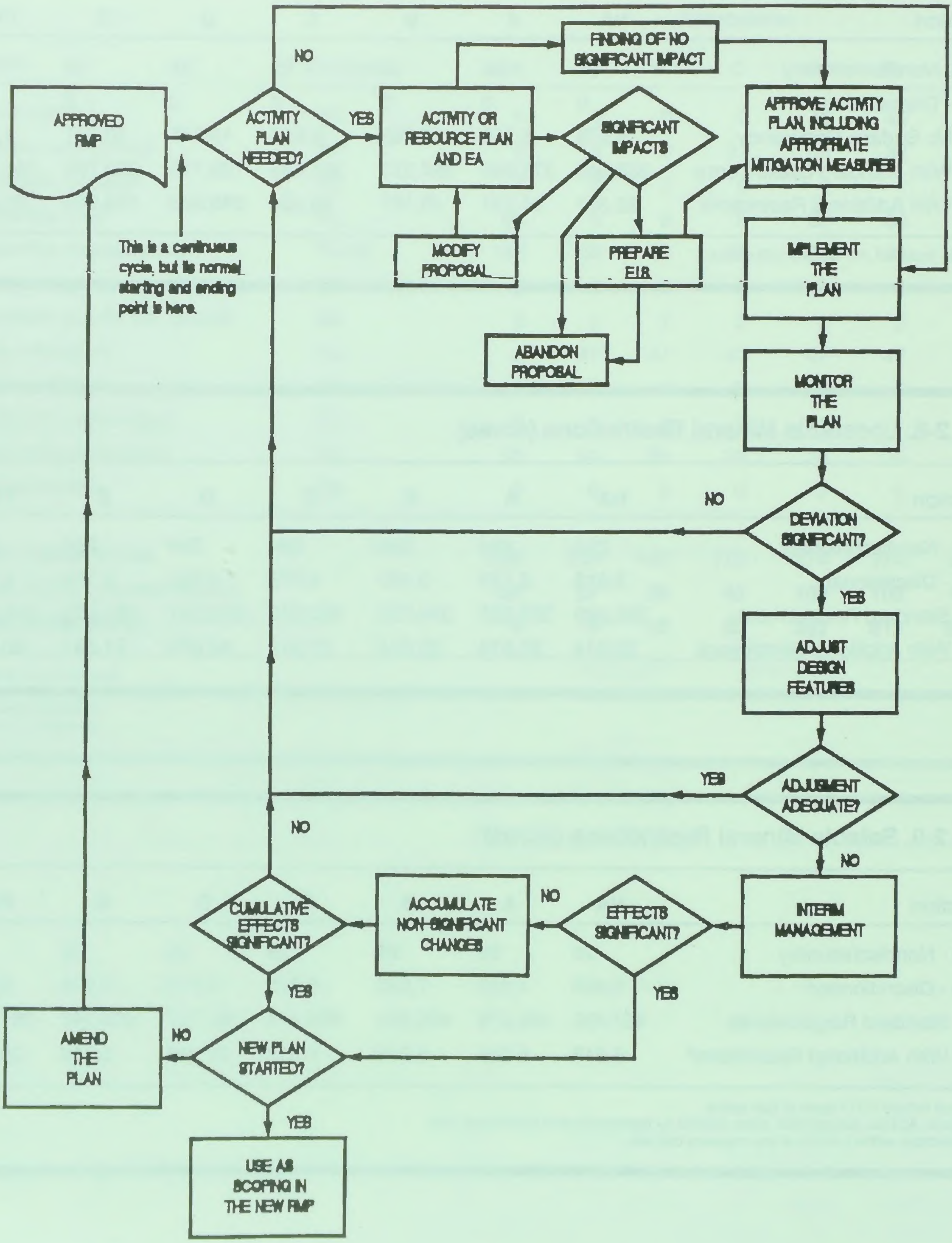
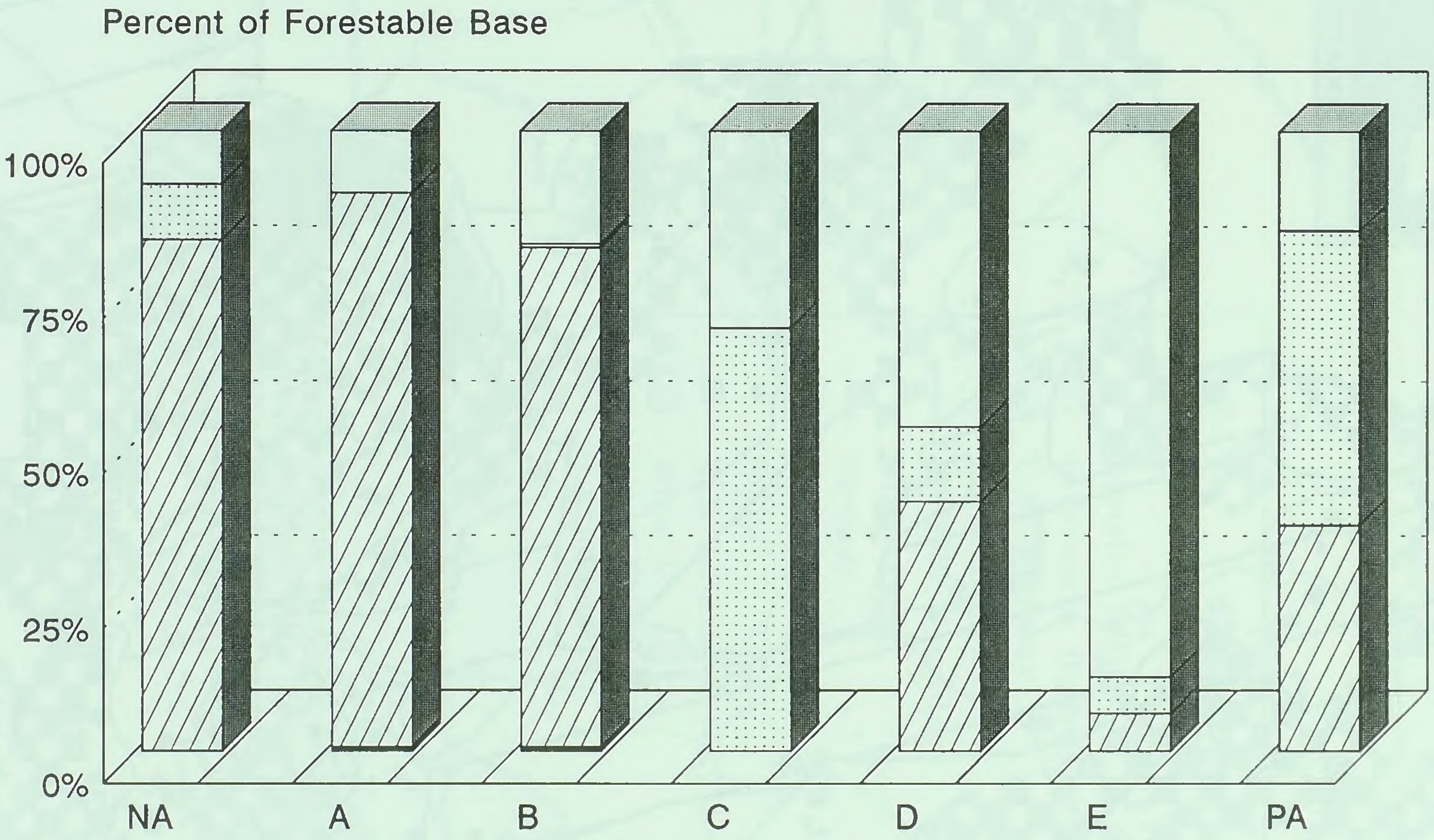

APPROVED RMP
ACTIVITY PLAN NEEDED?
NO
YES
ACTIVITY OR RESOURCE PLAN AND EA
FINDING OF NO SIGNIFICANT IMPACT
SIGNIFICANT IMPACTS
APPROVE ACTIVITY PLAN, INCLUDING APPROPRIATE MITIGATION MEASURES
MODIFY PROPOSAL
PREPARE E.I.S.
ABANDON PROPOSAL
IMPLEMENT THE PLAN
This is a continuous cycle, but its normal starting and ending point is here.
MONITOR THE PLAN
NO
DEVIATION SIGNIFICANT?
YES
ADJUST DESIGN FEATURES
YES
ADJUSTMENT ADEQUATE?
NO
NO
INTERIM MANAGEMENT
EFFECTS SIGNIFICANT?
NO
ACCUMULATE NON-SIGNIFICANT CHANGES
CUMULATIVE EFFECTS SIGNIFICANT?
YES
YES
AMEND THE PLAN
NO
NEW PLAN STARTED?
YES
USE AS SCOPING IN THE NEW RMP

Figure 2.1. Process for Changing the RMP

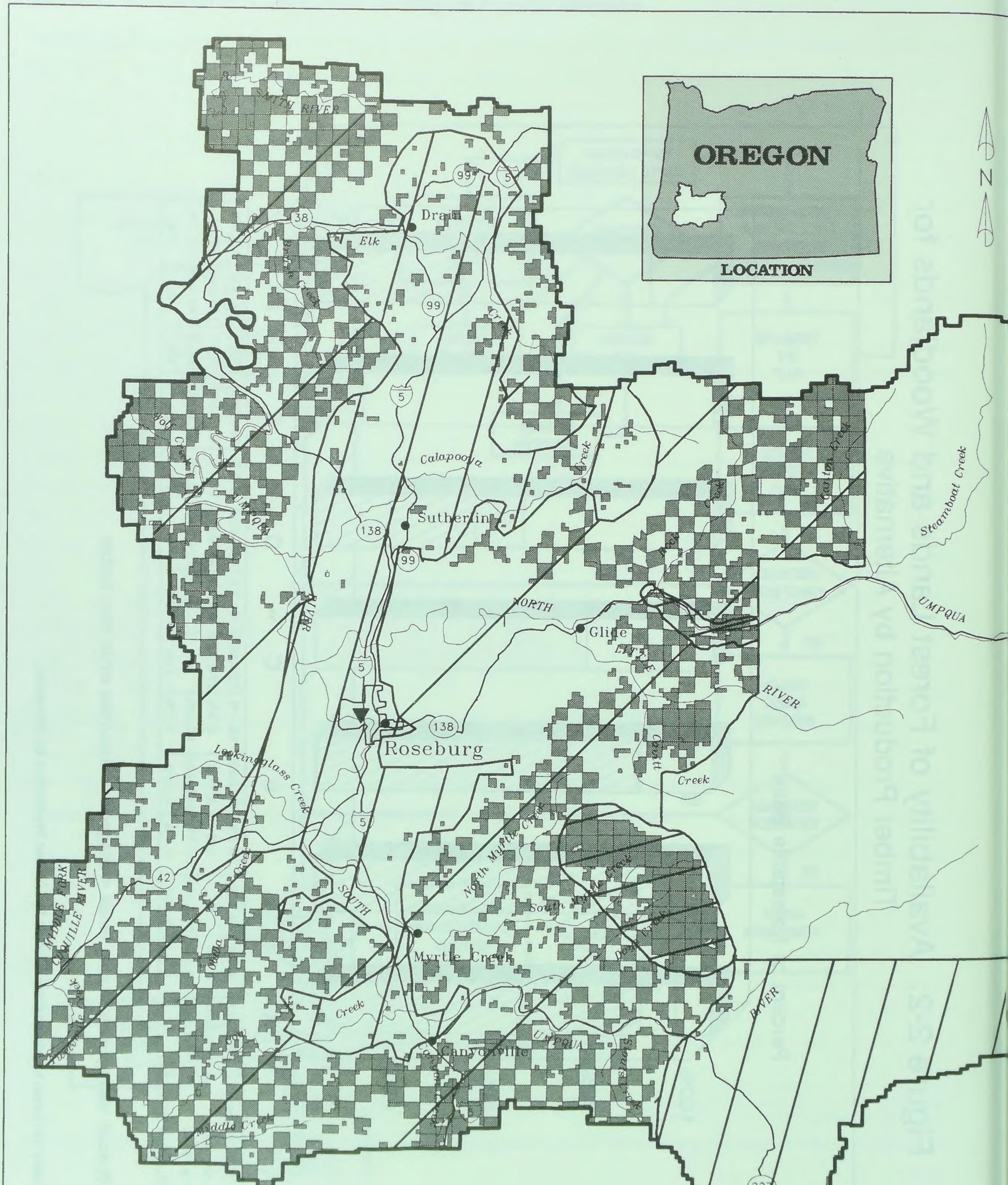
Figure 2-2. Availability of Forest Lands and Woodlands for Timber Production by Alternative



		NA		A		B		C		D		E		PA	
SMA's (Out-of-Base)	☐	34,400	8.6%	39,400	10.0%	71,600	18.1%	125,300	31.7%	188,400	47.6%	348,200	88.0%	63,000	15.9%
Restricted Base	⬚	35,900	8.9%	0	0%	2,400	0.6%	270,200	68.3%	47,900	12.1%	23,400	5.9%	188,300	47.6%
Intensive Base	▨	331,600	82.5%	353,300	89.3%	318,900	80.6%	0	0%	159,300	40.3%	23,900	6.0%	144,300	36.5%
Suitable Woodlands	■	0	0%	2,900	0.7%	2,600	0.7%	100	0%	0	0%	0	0%	0	0%

SMA: Special Management Areas, lands managed for resources other than timber.

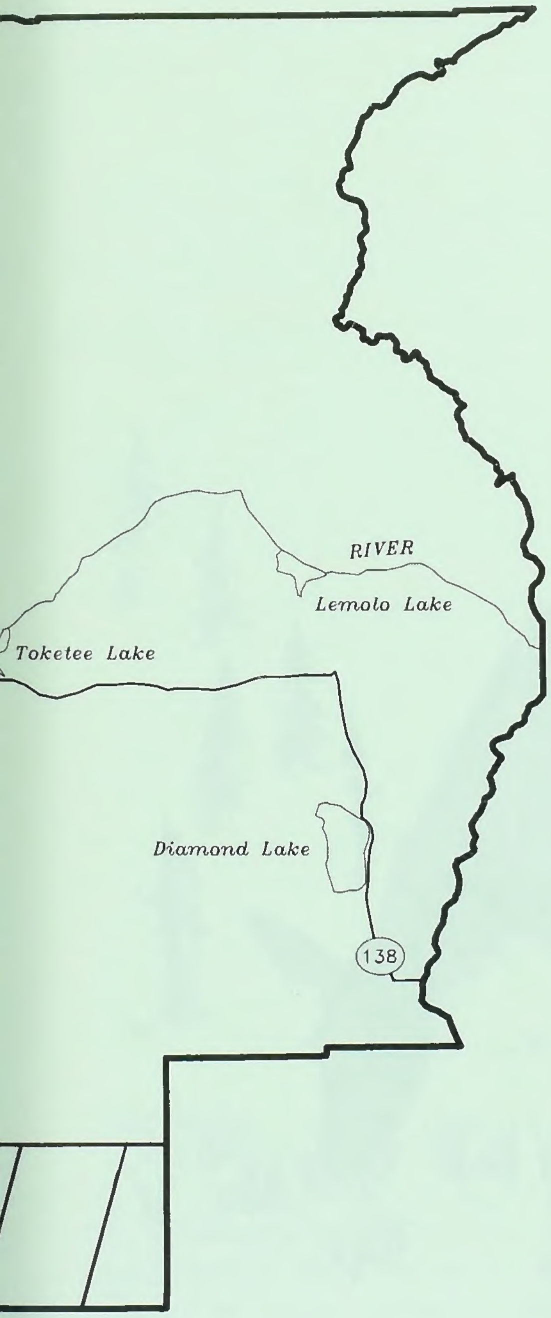
Figure 2.2. Availability of Forest Lands and Woodlands for Timber Production by Alternate.


OREGON
LOCATION
N
SMITH RIVER
99
5
38
Drain
Elk
Creek
99
5
Wolf Creek
UMPQUA
Calapooya
Creek
Rock
Creek
Canton Creek
Steamboat Creek
138
Sutherlin
99
RIVER
NORTH
Glide
UMPQUA
LITTLE
RIVER
5
138
Roseburg
Lookingglass Creek
Cavitt
Creek
5
42
North Myrtle Creek
South Myrtle Creek
MIDDLE FORK
COQUILLE RIVER
SOUTH
Olalla
Myrtle Creek
Creek
RIVER
UMPQUA
Canyonville
Middle Creek
227
10
0
10
20
MILES

U.S. Department of the Interior
Bureau of Land Management

ROSEBURG DISTRICT
1992 RMP/EIS

DRAFT



LEGEND

▼	District Office
5	Interstate Highway
199	U.S. Highway
46	State Highway
━	District Boundary
—	Highway
—	Stream
⬠	Urban Area
●	City
■	BLM Administered Land
▭	Zone I
▨	Zone II
◫	Zone III *

*Zone III lands include scattered parcels located outside the Zone III area shown on the map. See Appendix for legal descriptions of all Zone III lands.

MAP 2-1: LAND TENURE ZONES

Chapter 3

Affected Environment

Introduction

This chapter describes the physical, biological and socioeconomic characteristics of the BLM-administered lands as they now exist on the Roseburg District. Emphasis has been placed on resources that could be affected by BLM management alternatives as described in Chapter 2. Information provided is commensurate with the importance of impacts, and less important material has been summarized or simply referenced.

The primary sources of information used in preparing this chapter were BLM Planning System documents developed by the district. The Analysis of the Management Situation (AMS), and other resource inventories are available for review at the Roseburg District Office, 777 Garden Valley Blvd., Roseburg, OR 97470, during normal working hours. Other references are cited within the text by author and date of publication. A listing of these references appears in the References Cited section.

Preparation of this chapter is heavily dependent on the Bureau Automated Resource Data (ARD) and supporting Geographic Information System (GIS) technology. Acres used, unless otherwise noted, are derived from ARD/GIS. As they are computer generated they may not be the same as shown on the Master Title Plats (MTP), which are computed from cadastral survey notes and represent "official" acres. Likewise, ARD acres may differ from previously published BLM statistics, inventory records, timber sale maps or similar documents.

Climate

The area has a temperate marine climate with warm summers and mild, wet winters. In Roseburg, the mean maximum temperature is 84° F, the mean minimum is 33° F. The record high was 109° F in 1946 and the record low was -6° F in 1888. During summer days, soil temperatures have been found to exceed 160° F. Monthly precipitation, mostly as rain, ranges from 5.46 inches in Riddle and 8.89 inches in Reston during January to less than 0.3 inches during July. Average precipitation is about 45 inches annually in the Roseburg District. The maximum recorded was 60 inches at Twelvemile Creek. Snow may block roads in some winters, but snow is generally short-lived.

Air movement patterns are predominately from the north, except during the late fall and early winter months (November, December, January), when winds are southerly. Mean yearly wind speeds in Roseburg are 4.5 miles per hour.

During the late summer and fall months, the valleys and interior hills of Douglas County are subject to frequent night-time inversions — cool air stabilizing below warmer air above. Specific information on the extent and duration of these conditions within the area is not available.

Geology and Topography

The Roseburg District is located within the Coast Range, the Klamath Mountain and the Western Cascades physiographic provinces (Figure 2-1). The Coast Range is made up of submarine basalts and marine sediments of the Tyee and Umpqua Formations. The Klamath Mountain province is geologically complex, consisting of marine sediments, plutonic and volcanic rocks that have been folded, faulted and metamorphosed. The topography is rugged due to the resistant type of rock found there. Serpentine is fairly widespread in the Klamath Mountains, and extends northeasterly from the Cow Creek area through the central and southern part of the district. Granite and diorite bedrock are found in several large areas in the southeastern part of the district. These erode easily, creating steep, short sideslopes and sharp ridges.

Also found in the Klamath Mountain province are thickly bedded sandstone and thin interbeds of mudstone, volcanic rock sometimes called greenstone because of the abundance of chlorite, and a chert pebble conglomerate overlain by sandstone, silstone and conglomerate. The Western Cascade Province is characterized by a rugged topography with irregular ridges and deep narrow valleys. The rocks are mostly volcanics. Intrusive rock bodies in the Western Cascades are generally small and consist of plugs, dikes, sills, and domes.

Throughout the district, slopes range from 0 percent to vertical and average about 60 percent. Over 40 percent of the area has slopes in excess of 65 percent. Elevations range from 150 feet at Elkton, 500 feet at Roseburg and 650 feet at Myrtle Creek to 2,800 feet at Baughman Lookout, 3,900 feet at Dutchman Butte, 4,400 feet at Deadman Mountain and 4,800 feet at Huckleberry Mountain.

Lands and Transportation

Land Status

As shown on Map 1-1, BLM-administrated lands are primarily in a checkerboard ownership pattern. Table 3-1 displays the BLM ownership by county within the planning area. The BLM ownership is approximately 29 percent of the planning area.

Table 3-1. Lands within Planning Area by County and Ownership

	Acreage of				
County	O&C	CBWR	PD	Total Surface	Reserved Minerals
Douglas	390,978	13,924	18,426	423,328	1,717
Lane	280	0	0	280	0
Jackson	320	0	0	320	0
Totals	391,578	13,924	18,426	423,928*	1,717

*Acreages based on most recent surveys taken from Master Title Plats.

Land Tenure

Under the land use plan approved in 1983, the district has sold nine parcels of public land totaling approximately 60 acres. No lands were acquired through revocation of withdrawals or land exchanges.

Proposed land tenure adjustments under this plan will be conducted under the following concept: public lands are designated into three zones which identify the relative importance to efficient and beneficial resource management of the lands. A general description of each zone may be found in Chapter 2.

The district currently has six documented exchange proposals, which if implemented, could result in the exchange of 3,260 acres of BLM-administered lands for 3,380 acres of non-federal land. In addition to the documented exchange proposals, other inquiries and verbal proposals are received on a regular basis.

Land Use Authorizations

There are six Federal Land Policy Management Act (FLPMA) section 302 leases, covering approximately 8 acres, currently administered by the district. Five of these leases are for residences partially or wholly located on public land. The sixth lease provides for subleasing land and facilities to local organizations and groups for recreation. Douglas County maintains Richard Baker County Park as a day use area under a Recreational and Public Purpose (R&PP) lease.

Withdrawals and Classifications

Withdrawals and classifications existing on the district are shown in Appendix 3-1, Table1. Withdrawals generally segregate lands from operations under the general non-discretionary land laws, mining laws, and sometimes the mineral leasing laws but they do not always necessarily affect BLM surface management. Classifications generally segregate the lands from all forms of appropriations under the public land laws, including the mining laws, but not the mineral leasing laws. All BLM withdrawals and classifications existing in 1984 which are subject to the review provisions of FLPMA 204(l) and 202(d) have been reviewed (except powersite classifications, reserves, and water power designations) and recommendations for continuance, termination or reduction in size have been forwarded to the Oregon State Office.

All powersite reserve classifications, water power designation withdrawals, and other agency withdrawals are scheduled to be reviewed during the 1990s. No withdrawal petition applications or relinquishments are pending. One withdrawal is proposed for 147.99 acres which includes BLM's Susan Creek Campground.

Rights-of-Way Corridors, Major Rights-of-Way and Leases

Existing undesignated right-of-way corridors include Bonneville Power Administration and private utility transmission lines. These corridors are shown on Map 3-1 and include lines of 69kV and greater voltage. The Western Regional Corridor Study (Dec. 1986) identified one potential new corridor that would affect BLM-administered lands in the district. The future upgrading of existing transmission lines is considered likely and may require additional right-of-way width.

There are no permit applications for Federal Energy Regulatory Commission (FERC) hydroelectric projects in the planning area. To date solar and wind power electrical generation has not occurred on public land. Advances in technology during this planning period could increase interest in the public lands for developing these alternative energy resources.

Additional rights-of-way have been granted for: the construction of logging roads, driveways and utility lines for servicing residences, domestic and irrigation water pipelines, legal ingress and egress, etc. Many of these grants are within or adjacent to road clearing limits.

Because public and private lands are intermingled within the district boundary, each party must cross the lands of the other in order to access its timber. Throughout most of the district this has been accomplished through Reciprocal Logging Road Right-of-Way Agreements with neighboring private landowners. The individual agreements and associated permits (a total of 140 on the district) are subject to the regulations which were in effect when they were executed or assigned. Appendix 3-2 displays the individual agreements.

Communication Sites

There are seven communication sites located on public land in the district with locations shown on Map 3-1. Five are developed sites with numerous users and are occupied with two-way, microwave and low power translator type users; these uses are generally compatible. Users with high power transmissions are usually not compatible with existing uses on these developed sites. There is a high probability of need for additional sites in the future to accommodate all user groups and to satisfy the demand expected to be created by new technology including satellite communications, cellular mobile, etc.

Additional sites have not been identified by the public, but it can be assumed that the higher elevational areas will be targeted.

Roads

In support of the timber management program, an average of 60 miles of road per year have been constructed and an average of 1100 miles of road per year maintained over the past 10 years. Table 3-2 displays the current inventory of BLM controlled roads. Existing roads occupy approximately 15,900 acres. Easements and/or reciprocal right-of-way agreements provide physical access to approximately 90 percent of district lands for timber management. The district has also developed 120 man-made structures or access points in streams and rivers to provide water for the prescribed fire program, for suppression of wildfire or for use in road construction or maintenance operations.

The miles of road on the district which are controlled or improved by the BLM, including roads under contract, are listed by Federal Highway Functional Classification (1989), as single or double lane, and by surfacing type. They are displayed in Table 3-2.

Air Resources

The passage of the Clean Air Act in 1963 and subsequent amendments require Oregon to meet visibility and health standards through development of a State Implementation Plan (SIP). The Oregon Smoke Management Plan (SMP) is a part of the SIP and identifies strategies for using prescribed fire in forested areas. The SIP identifies population centers that do not meet the National Ambient Air Quality Standards (NAAQS). The NAAQS are health standards and are established by the Environmental Protection Agency for six criteria air pollutants. Population centers not meeting the NAAQS air quality standards are termed non-attainment areas which necessitates actions that will return the area to attainment status. Oregon's State Implementation Plan has been approved by the Environmental Protection Agency and BLM must comply.

The element identified in the SIP associated with resource management activities on the Roseburg District, is smoke from prescribed fire. This smoke is composed of particulate matter (PM) which is one of the criteria air pollutants. Other potential sources include woodstoves and dust from unpaved roads. Particulate matter with a nominal size of 10 microns or less (PM10) is the specific pollutant identified in the SIP.

The population centers of Eugene/Springfield, Oakridge, Grants Pass, Medford Air Quality Management Area (AQMA), Klamath Falls, and LaGrande are currently in violation of the PM10 standard and classified as non-attainment areas for this pollutant. The non-attainment status of these communities is generally not attributable to prescribed fire. In addition, the air quality in Grants Pass has significantly improved and it may be removed from the list of non-attainment areas.

Table 3-2. Current Road Inventory

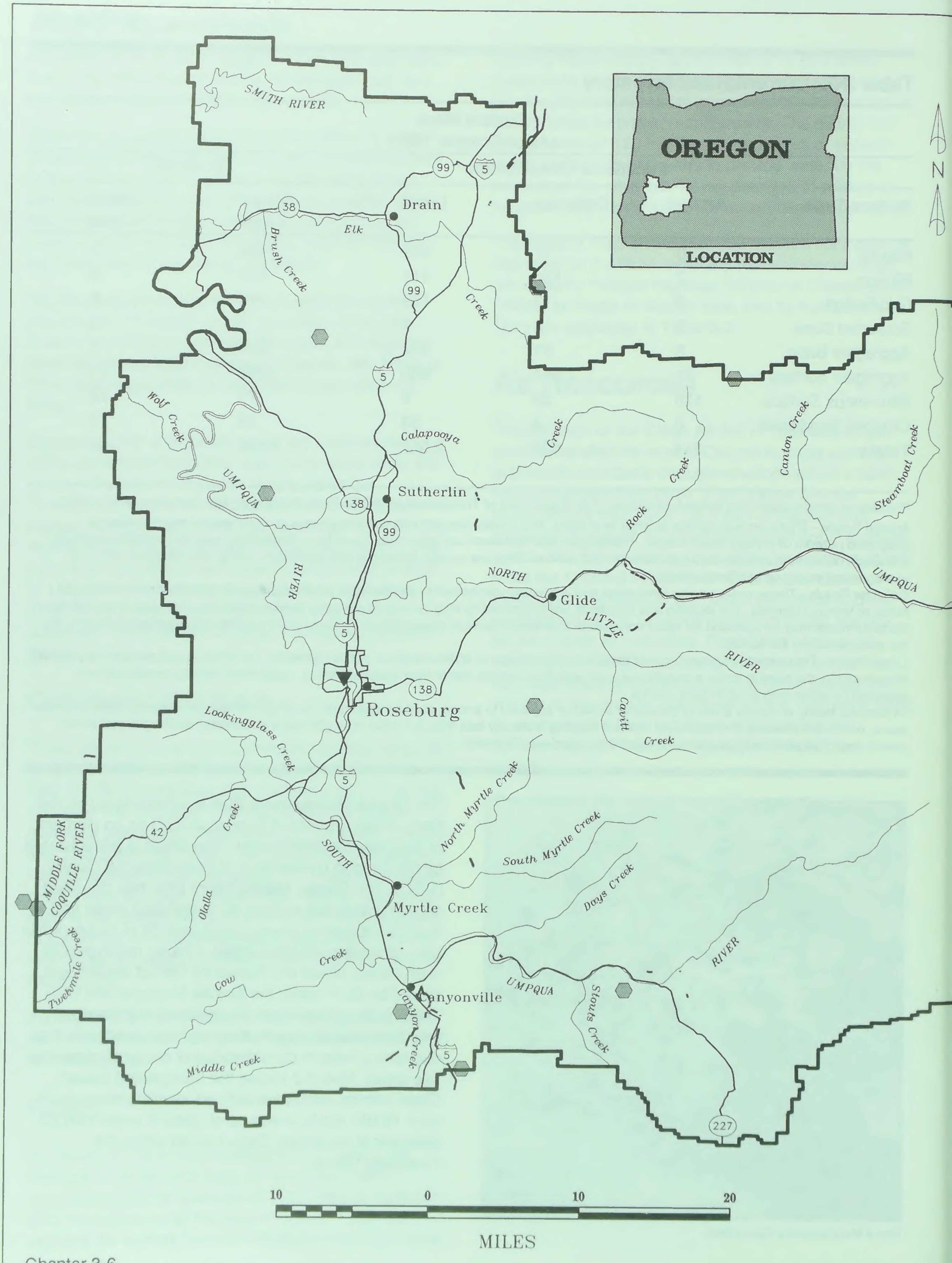
	Current Miles (As of October 1991)				
	Functional Classification[1]			Standard	
Surface Type	Arterial	Collector	Local	Single Lane	Double Lane
Natural	0	17	442	460	0
Pit Run	7	134	411	554	0
Grid Rolled	0	13	133	146	0
Screened Base	0	0	1	1	0
Aggregate Base	8	91	222	321	0
Aggregate Surface	71	344	805	1,208	11
Bituminous Surface	128	23	5	77	78
Crushed Sandstone	0	4	33	38	0
Totals	**214**	**626**	**2,052**	**2,805**	**89**

[1] Functional classifications are defined as follows: (US Department of Transportation (DOT), Federal Highway Administration (FHA) 1989):
Arterial Roads - These provide service to large land areas, and usually connect with public highways or other arterial roads to form an integrated network of primary travel routes. The location and standards are often determined by a demand for maximum mobility and travel efficiency, rather than specific resource management service. They are usually developed and operated for long term land and resource management purposes and constant service.
Collector Roads - These serve smaller land areas and are usually connected to an arterial or public highway. They collect traffic from local roads or terminal facilities. The location and standards are influenced by long-term multi-resource service needs, as well as by travel efficiency. Collector roads may be operated for either constant or intermittent service, depending on land use and resource management objectives for the area served by the facility.
Local Roads - These roads connect terminal facilities[2] with collector or arterial roads or public highways. The location and standard are usually determined by the need to serve a specific resource activity or project, rather than travel efficiency. Local roads may be developed and operated for either long or short-term service.

[2] A terminal facility is usually a site at the end of a road or adjacent to a road, such as trailheads, landings, viewpoints, wayside stops, parking spurs, or comfort stations. The access to terminal facilities is usually less than 0.1 miles in length and is considered an integral part of the parent road. Terminal facilities are found on all three road classifications.

Road Maintenance Operation.

The Smoke Management Plan is administered by the Oregon Department of Forestry (ODF) as an element of the State Implementation Plan which is administered by the Oregon Department of Environmental Quality (DEQ). The Smoke Management Plan has classified certain population centers as designated areas and specific recreation areas during periods of heavy public use, as smoke sensitive areas. Smoke management instructions, which the Roseburg District follows, are issued by ODF under the Smoke Management Plan. These instructions direct the ignitions of prescribed fires based on favorable atomospheric conditions that disperse smoke in consideration of designated/special use areas. Map 3-2 shows the “designated areas”; Class I areas, which are defined as wilderness areas over 10,000 acres in size, and Class II areas with the potential of becoming Class I areas within the Roseburg District.


OREGON
LOCATION
N
SMITH RIVER
99
5
38
Drain
Elk
Brush Creek
99
Creek
5
Wolf Creek
Calapooya
UMPQUA
Sutherlin
138
99
Creek
Rock
Creek
Canton Creek
Steamboat Creek
RIVER
NORTH
UMPQUA
Glide
LITTLE
RIVER
5
138
Roseburg
Lookingglass Creek
Cavitt
Creek
5
North Myrtle Creek
42
Creek
MIDDLE FORK
COQUILLE RIVER
SOUTH
South Myrtle Creek
Days Creek
Olalla
Myrtle Creek
Twelvemile Creek
Creek
Cow
RIVER
UMPQUA
Canyonville
Canyon Creek
Stouts Creek
5
Middle Creek
227
10
0
10
20
MILES

U.S. Department of the Interior
Bureau of Land Management

ROSEBURG DISTRICT
1992 RMP/EIS

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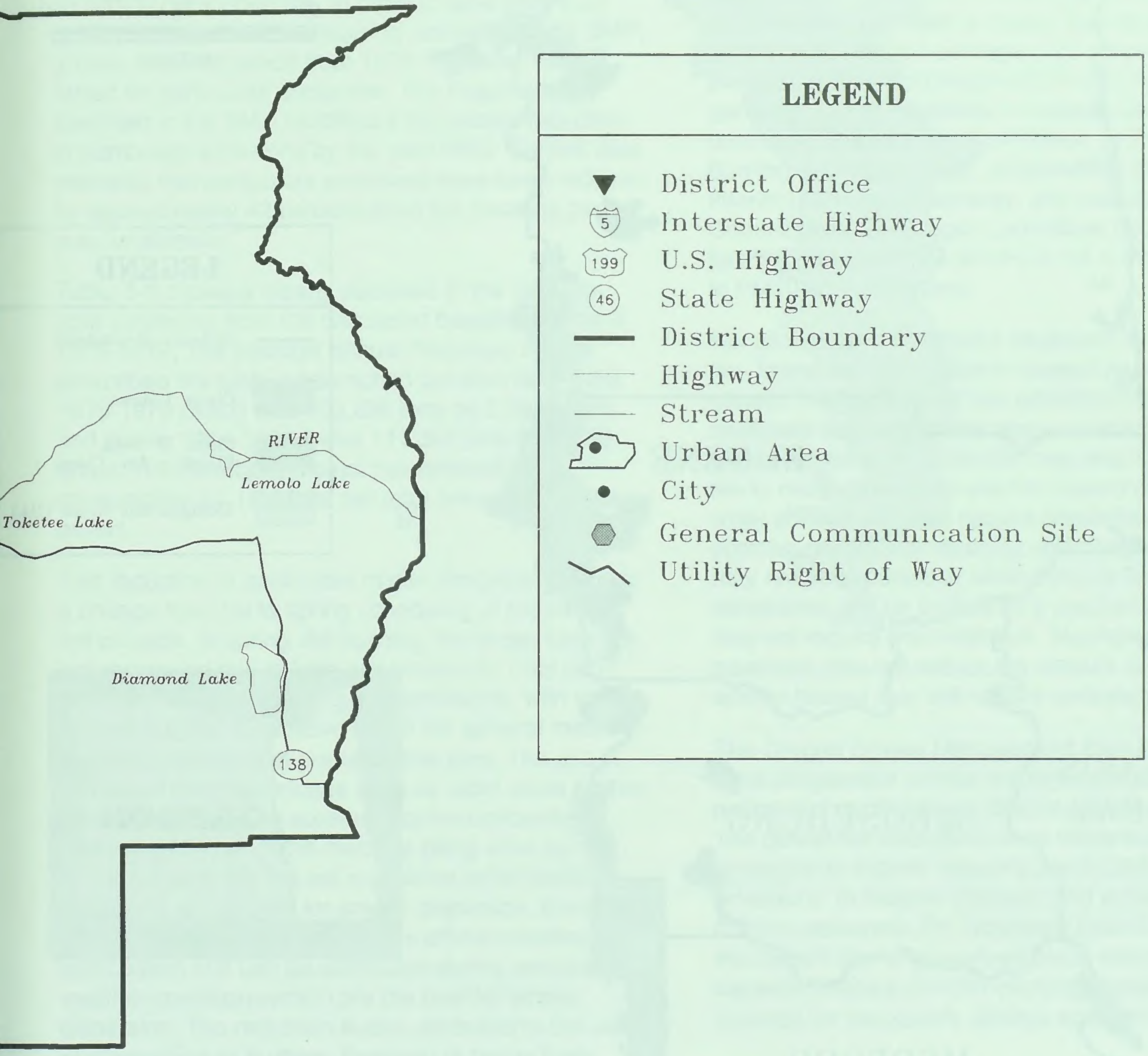
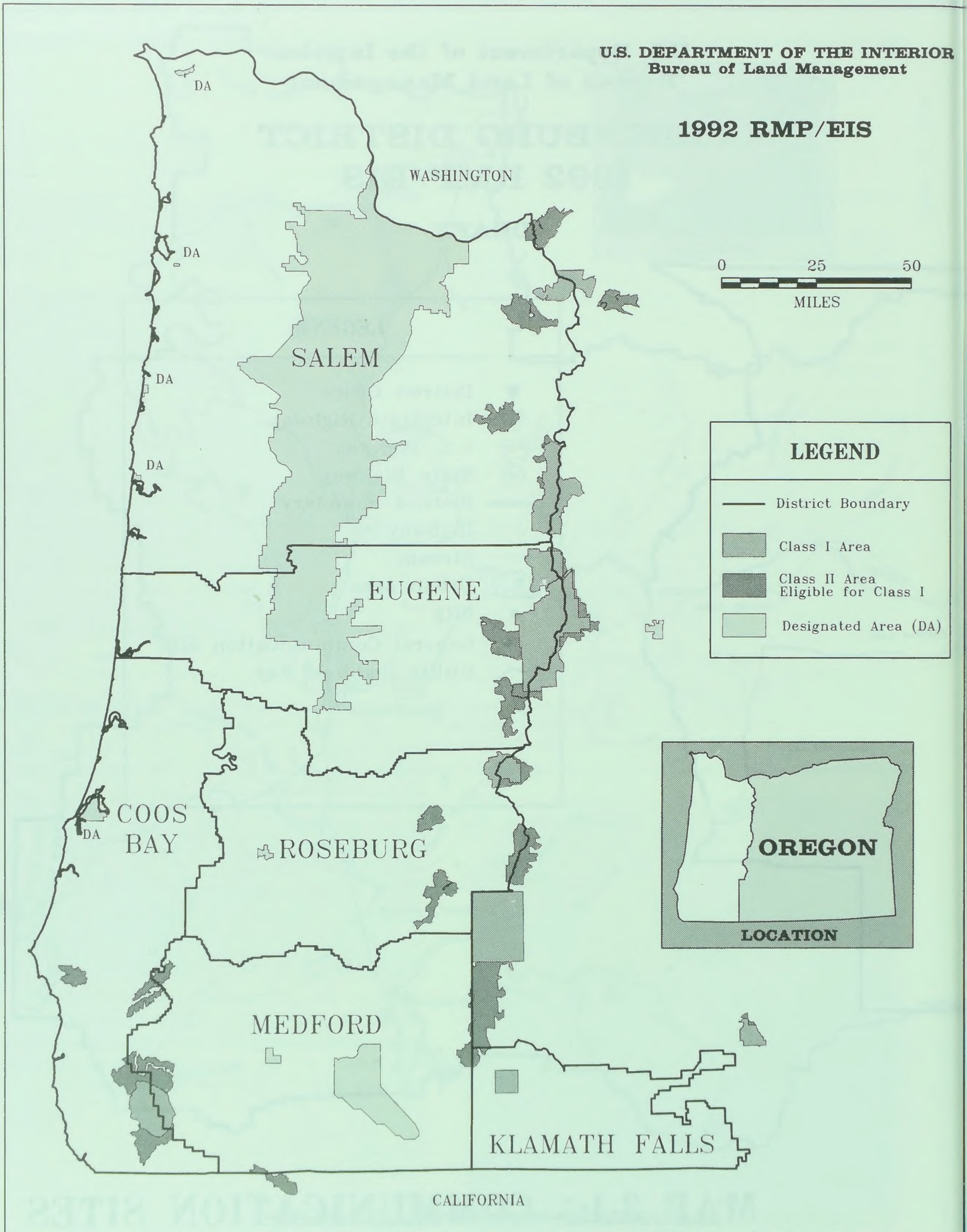


MAP 3-1: COMMUNICATION SITES AND UTILITY RIGHTS OF WAY



MAP 3-2: SENSITIVE AIR QUALITY AREAS

The Clean Air Act gives standards for NAAQS and goals for visibility. Visibility goals are established to prevent significant deterioration of the visibility in Class I wilderness areas which were in existence on August 7, 1977. The Oregon Visibility Protection Plan outlines the goals toward rectifying existing impairment and protecting future visibility. In an effort to determine the effectiveness of the standards and goals toward meeting improved air quality, strategies have been established that describe specific actions to be taken regarding prescribed fire. In order to determine if air quality improvement is occurring according to the SMP, a base line time period from 1976-1979 was established for particulate emissions. The major strategy identified in the SMP identifies a 50 percent reduction in particulate emissions by the year 2000. Current data indicates that particulate emissions have been reduced by approximately 42 percent since the baseline period was established.

Table 3-3 shows a steady decrease in the tons per acre emissions from the calculated baseline period of 1976-1979. The average annual Roseburg District prescribed fire fuels consumption per acre during the 1976-1979 period was 103,238 tons on 2,264 acres, and during 1984-1988 it was 111,382 tons on 3,350 acres. The Roseburg District has reduced fuels consumption by 12.4 tons per acre below the baseline period.

This reduction in particulate matter emissions is due to a change from fall to spring scheduling of prescribed fire projects. In spring-like burning, the larger fuels are not consumed due to high fuel moistures. Fuel consumption is lower, creating less emissions, with smoke dispersal easier to achieve under the general meteorological conditions that prevail at this time. The use of advanced firing techniques such as rapid aerial ignition reduce emissions by accelerating the combustion process while hand and machine piling allow for burning during the late fall and winter when weather conditions are optimal for smoke dispersion. Burning of piled material is generally a more efficient method of combustion and can be scheduled during unstable weather conditions which are the best for smoke dispersion. The reduction is also attributed to the use of alternatives to burning. Removal of heavy fuels, boles and limbs, for use as secondary wood products, power generation, and firewood, will have some application in the future, but the use of this material is dependent upon environmental constraints and available markets.

Misconceptions concerning the interaction between woodstoves and prescribed fire continue despite the data collected. While industrial sources and dust account for a major part of non-attainment in some areas, woodstove particulate pollution is the major cause of non-attainment in Klamath Falls, Medford AQMA, Grants Pass, LaGrande, Oakridge and Eugene/Springfield. Generally, non-attainment status is the result of winter periods of air stagnation and woodstove use. Prescribed fire conducted at the same time as woodstove use, under the guidance of the SMP, is not a significant contributor to non-attainment status.

Particulate matter entering a designated area from a prescribed fire is called an intrusion. These intrusions are classified from light to heavy. During a three year period (1987-89), an average of 25 intrusions occurred per year in Western Oregon (ODF report) which were generally light to moderate in intensity and of short duration. A paper entitled “A Report on Prescribed Burning in Oregon, 1990”, prepared for the Joint Interim Environment, Energy, and Hazardous Material Committee of the Oregon Legislature shows that forestry prescribed fire smoke is not a major contributor to PM10 non-attainment.

Not all harvest units require treatment by prescribed fire. Some are not treated or treated by mechanical means. The decision to use prescribed fire as a treatment depends on the resource management objectives for a site. One site may require prescribed fire to meet silvicultural and fire hazard objectives, while another site may require prescribed fire to meet ecological/biological diversity objectives. Other sites may not have particular silvicultural or fire hazard constraints and be treated by a mechanical means or may not require any treatment. Mechanical or no treatment may not reduce the amount of fuel and the wildfire hazard may still require consideration.

The Oregon Smoke Management Plan is one of the most progressive smoke management plans in the nation and the Roseburg District adheres to it closely. The district will also continue to refine treatment strategies to include reducing particulate matter emissions. In order to maintain and enhance the public's resources, the Roseburg District will support the diligent use of prescribed fire to reduce wildfire hazards, prepare sites for planting seedlings, and manage for biologically diverse ecosystems.

Soil

Soil is a highly variable and complex layer of unconsolidated material. It consists of airspace, water, chemicals, gases, organic material, living organisms, and rock fragments. Soil is a fundamental component of the environment upon which all renewable resources of the Roseburg District are dependent. The combined influences of time, parent material, climate, living

Table 3-3. Annual Slash Consumption and Pollutant Emissions[1]

Year	BLM acres Burned	Consumption Rate(Ton/ac.)	Tons Consumed	TSP[2]	PM10[3]	Volatile Compounds Organinc[4]	Carbon Monoxide[5]	Sulfur Oxides[6]	Nitrous Oxides[7]	Total Contaminants
1976	2,264	45.6	103,238	1,698	(1,296)	1,291	13,984	206	206	17,384
1977	2,264	45.6	103,238	1,698	(1,296)	1,291	13,984	206	206	17,384
1978	2,264	45.6	103,238	1,698	(1,296)	1,291	13,984	206	206	17,384
1979	2,264	45.6	103,238	1,698	(1,296)	1,291	13,984	206	206	17,384
1980	2,409	33.4	80,461	1,324	(1,010)	1,006	10,898	161	161	13,550
1981	1,389	33.4	46,393	763	(582)	580	6,284	93	93	7,813
1982	1,249	33.4	41,717	686	(524)	521	5,651	83	83	7,025
1983	1,870	33.4	62,458	1,027	(784)	781	8,460	125	125	10,518
1984	1,656	33.4	53,310	877	(669)	666	7,221	107	107	8,978
1985	2,960	33.4	98,864	1,626	(1,241)	1,236	13,391	198	198	16,648
1986	3,095	33.4	103,373	1,700	(1,297)	1,292	14,002	207	207	17,408
1987	2,900	33.4	96,860	1,593	(1,216)	1,211	13,120	194	194	16,310
1988	2,788	33.4	93,119	1,532	(1,169)	1,164	12,613	186	186	15,681
Total:	**29,372**		**1,089,509**	**17,922**	**(13,673)**	**13,619**	**147,574**	**2,179**	**2,179**	**183,473**
Average										
1976-79	2,264		103,238	1,698	(1,296)	1,290	13,984	206	206	17,384
1981-84	1,541		50,970	838	(640)	637	6,904	102	102	8,583
1985-88	2,936		98,054	1,613	(1,231)	1,226	13,281	196	196	16,512
1981-88	2,238		74,512	1,226	(935)	931	10,093	149	149	12,547
Total Dist. Average	**2,259**		**83,808**	**1,379**	**(1,052)**	**1,048**	**11,352**	**168**	**168**	**14,113**

[1] Average emissions of carbon dioxide and water vapor are greater than 90 percent of all emissions and are not included in this table. Carbon dioxide emissions average 1 to 1½ tons/ton fuel consumed.

[2] Average emission is 34 pounds/ton fuel burned for broadcast burn and 12 pounds/ton fuel burned for piles.

[3] Average emission is 26 pounds/ton fuel burned for broadcast burn and 8 pounds/ton fuel burned for piles. As the PM 10 is a component of TSP it is not included in the total contaminants.

[4] Volatile Organic Compounds are a diverse class of compounds containing hydrogen, carbon and oxygen. Average emission is 25 pounds/ton burned.

[5] Average emission is 20 to 500 pounds/ton fuel. Carbon monoxide is unstable and dissipates rapidly in the atmosphere. (Used 270 lb./ton.)

[6] Sulfur oxides (SOx), which includes sulfur dioxide, are produced in small quantities and have average emissions of 4 pounds/ton fuel burned.

[7] Nitrous oxides (NOx), which includes nitrogen dioxide, have average emissions of 4 pounds/ton fuel burned.

Sources: Sandberg, et.al., (1979); U.S EPA (1978), and Ward, et.al., (1988).

organisms, and topography of a site have interacted to form a soil with a unique set of characteristics. These characteristics determine the productivity and management requirements of each soil.

Soils provide many functions such as storing and delivering water to streams and lakes as well as providing a medium for plant growth. The concept of soil productivity is a measure of a soil's ability to produce vegetation. Vegetation growth requires that the soil provide adequate moisture, aeration, nutrients, and anchorage. A number of soil properties (organic matter content, nutrients, texture, structure, porosity, and depth) are recognized as important for vegetation growth. These properties are influenced by soil displacement, compaction, erosion, and organic matter removal.

Soils information (distribution and characteristics) has been collected by Soil Conservation Service (SCS) and BLM soils scientists and is available at the district office. The SCS has mapped soils on the district at a scale of 1:24,000. The SCS has provided detailed soil characteristics including profile descriptions, texture classification, permeability, available water capacity, pH, etc. as well as interpretations by soil series.

The SCS has delineated large areas that have a distinctive pattern of soils, topography, and drainage. Each delineation, or soil association, is a unique natural landscape and consists of one or more major soils and some minor soils. Nineteen soil associations occur in the district. The soil associations were mapped using soil, climate (temperature and precipitation), landform, and geologic data. More detailed soil information is available at the district office.

An intensive inventory, Timber Productivity Capability Classification (TPCC), provides site specific information concerning land the district manages (see Timber Resources section). This information identifies fragile sites where the timber growing potential is easily reduced due to inherent soil properties and landform characteristics. Detailed information and classification descriptions are contained in the Roseburg District TPCC Handbook, Oregon Handbook 5251, and in the timber resources section of this chapter.

Table 3-4 displays acreage of fragile forest sites that are judged to be biologically and/or environmentally incapable of supporting a sustained yield of forest products; these acreages are TPCC classified as Fragile Nonsuitable Woodland and are not included in the commercial forest land base. Lands not included in the commercial forest land base because of critical moisture supplying capacities, severe nutrient problems, or high ground water levels may be harvested only when it is essential to the harvesting of adjacent commercial forest land. However, lands that are out of the base because of critical slope gradients and mass movement potential receive total protection from all harvesting and site preparation activities.

Table 3-5 displays acreage of forest sites less fragile than the nonsuitable woodland acres. These sites (fragile-suitable, restricted) are judged to be subject to unacceptable soil productivity loss as a result of forest management activities, unless special restrictive or mitigation measures (see Best Management Practices, Appendix 2-1) are used to protect them.

Table 3-4. Fragile Nonsuitable Woodland[1]

Classification of Woodland	Acres	Percent BLM Forest Land Base
Soil Moisture	13,965	3.4
Nutrient	4,525	1.1
Slope Gradient	1,834	0.5
Mass Movement Potential	1,212	0.3
Surface Erosion Potential	0	0.0
Groundwater	433	0.1
Total	21,969	5.4

[1] These are lands where timber growing potential will be reduced due to soils having critical moisture supplying capacities, severe nutrient problems, critical slope gradients, mass movement potential, severe surface erosion potential, or high ground water levels. See the "TPCC Classification" BLM Manual Supplement, OSO Handbook 5251-1 for more detailed description (USDI,BLM,OSO 1986b).

Table 3-5. Fragile-Suitable, Restricted Forest Land[1]

Classification of Forest Land	Acres	Percent BLM Forest Land Base
Soil Moisture	20,090	4.9
Nutrient	768	0.2
Slope Gradient	105,577	25.6
Mass Movement Potential	22,584	5.5
Surface Erosion Potential	4,991	1.2
Groundwater	3,884	0.9
Total	**157,894**	**38.3**

[1] These are lands where the timber growing potential may be reduced due to the soils having critical moisture supplying capacities, severe nutrient problems, critical slope gradients, mass movement potential, severe surface erosion potential, or high ground water levels. See the "TPCC Classification" BLM Manual Supplement, Oregon State Office, Handbook 5251-1 for more detailed description (USDI,BLM,OSO 1986b).

Water Resources

Introduction

The Federal Water Quality Act of 1987 directs federal agencies to meet state laws and regulations pertaining to the beneficial uses identified by the states and any applicable water quality standards that have been established. The State of Oregon has established a list of beneficial uses that apply to the Umpqua (OAR 340-41-282 and OAR 340-41-285) and South Coast (OAR 340-41-322 and OAR 340-41-325) Basins, in which lands are administered by the Roseburg BLM District. Applicable water quality requirements provide protection for those uses. The Oregon water quality criteria pertaining to BLM management practices are (OAR 340-41-245), (OAR 340-41-445) and the anti-degradation policy, OAR 340-41-026 (1) (A).

Forest hydrology is a collection of complex processes which transform precipitation to streamflow and/or ground water. Appendix 3-3 discusses these processes and their relationship to forest management practices. Maintenance of water quality is important for all beneficial uses and water quality is reflective of watershed and forest management that interact with the forest hydrology. The beneficial uses of primary concern that are related to land management activities in analytical watersheds (AWS) on the Roseburg District are rearing and spawning habitat for salmonids, domestic water supply, fishing, and water contract recreation (Table 3-6).

Existing Water Resources

The Umpqua Basin has been subdivided into fourteen analytical watersheds. In addition, one South Coast Basin AWS (Middle Fork Coquille) is shared by Roseburg and Coos Bay Districts. Analytical watersheds were established to facilitate assessment of existing conditions and to analyze proposed management alternatives (Table 3-7). Each AWS was selected according to topography and basin size (Map 3-3).

The BLM is responsible for managing and monitoring management activities as well as maintenance of surface and groundwater quality in the AWSs. Background hydrology information is available for many streams in AWSs on the district. Surface water yield, annual flows, 25-year flood levels, and minimum flows vary between AWSs because of differences in precipitation and topography (Table 3-8).

Table 3-6. Beneficial Uses of Waters in the Roseburg District

Beneficial Uses	All Analytical Watersheds
Public Domestic Water Supply	X
Private Domestic Water Supply	X
Industrial Water Supply	X
Irrigation	X
Livestock Watering	X
Salmonid Fish Rearing	X
Salmonid Fish Spawning	X
Resident Fish and Aquatic Life	X
Wildlife and Hunting	X
Fishing	X
Boating	X
Water Contact Recreation	X
Aesthetic Quality	X
Hydroelectric Power	
Commercial Navigation and Transportation	

There are many lakes and reservoirs within the district. These provide beneficial uses such as recreation, irrigation, flood control, domestic water supplies, power generation, and fish and wildlife habitat. Reservoirs have been constructed in the past by the county in order to supplement summer water supplies.

Groundwater also contributes to the district water resource. There are seven wells on district administered lands, one at a Forest Service Administrative site and a capped well along the North Umpqua River. These wells are located at the following recreation sites: Susan Creek Campground (2), Susan Creek day use area, Scaredman, Millpond, Cavitt Creek, and Tyee. The groundwater in these wells is replenished by rain and snow which filters through soil and geologic formations. This underground water generally moves slowly from mountains and uplands to lowlands and valleys where it is discharged to creeks, rivers, and marshes.

Groundwater discharges to surface waters provide the base flow for streams throughout Oregon. This discharge may vary significantly in different areas, depending on the nature of the aquifer. The North Umpqua, for example, gets much of its summer flow from groundwater discharge, giving it adequate discharge for most uses. Conversely, the Coquille

Table 3-7. Roseburg District Analytical Watersheds

Watershed Name	Analytical Watershed Acres	Percent of Watershed in BLM Management	Stream Order	Miles of Stream
Upper Smith River	50,907	62	1&2	309
			3	65
			4	31
			5	27
			6+	23
Elk Creek	224,236	25	1&2	1,240
			3	246
			4	126
			5	71
			6+	74
Calapooya	183,661	8	1&2	414
			3	153
			4	76
			5	38
			6+	26
Upper Umpqua Frontal	79,384	46	1&2	176
			3	85
			4	40
			5	22
			6+	26
Lower North Umpqua	108,114	4	1&2	96
			3	40
			4	15
			5	8
			6+	1
Little River	47,113	37	1&2	144
			3	42
			4	16
			5	11
			6+	19
Rock Creek	88,925	46	1&2	239
			3	97
			4	36
			5	12
			6+	24
Canton Creek	39,477	45	1&2	235
			3	35
			4	16
			5	8
			6+	11

Table 3-7. Roseburg District Analytical Watersheds (cont.)

Watershed Name	Analytical Watershed Acres	Percent of Watershed in BLM Management	Stream Order	Miles of Stream
South Umpqua/Roseburg	122,868	4	1&2	95
			3	42
			4	21
			5	5
			6+	12
Lower South Umpqua	65,740	38	1&2	321
			3	76
			4	30
			5	26
			6+	27
Olalla/Lookingglass	134,934	24	1&2	433
			3	130
			4	69
			5	42
			6+	29
Myrtle Creek	76,230	41	1&2	279
			3	87
			4	50
			5	27
			6+	26
Upper South Umpqua	101,693	43	1&2	465
			3	114
			4	57
			5	31
			6+	25
Cow Creek	116,250	36	1&2	694
			3	140
			4	66
			5	36
			6+	43

River system runs high during the rainy winter months, but limited groundwater discharge in dry summer months results in very low stream flow.

Groundwater is used throughout the Roseburg District for irrigation, domestic and municipal use. Groundwater supplies in the Umpqua Basin are highly variable and limited. Most wells produce only enough water to supply single households and some may go dry during the summer. In the Drain-Yoncalla area, water supply is very poor. In the Willis and Rice Creek drainages, groundwater is almost non-existent. Cow Creek has one of the better groundwater supplies in the county. Winston, Tenmile, Elkton, and Olalla have fair groundwater supplies.

The BLM is presently not involved in groundwater quality monitoring on the Roseburg District other than the maintenance of seven wells on land the district administers. Groundwater quality degradation is usually in the form of pollution that can result from any number of industrial, commercial, agricultural, or residential activities. Once polluted, groundwater is extremely difficult and costly to clean up. The Roseburg District is replacing 10 underground fuel storage tanks to prevent possible groundwater contamination. Groundwater quality is generally good in all watersheds, with the exception of a some localized problems with mineralized water, sulfer, arsenic, and local pollution of shallow aquifers.

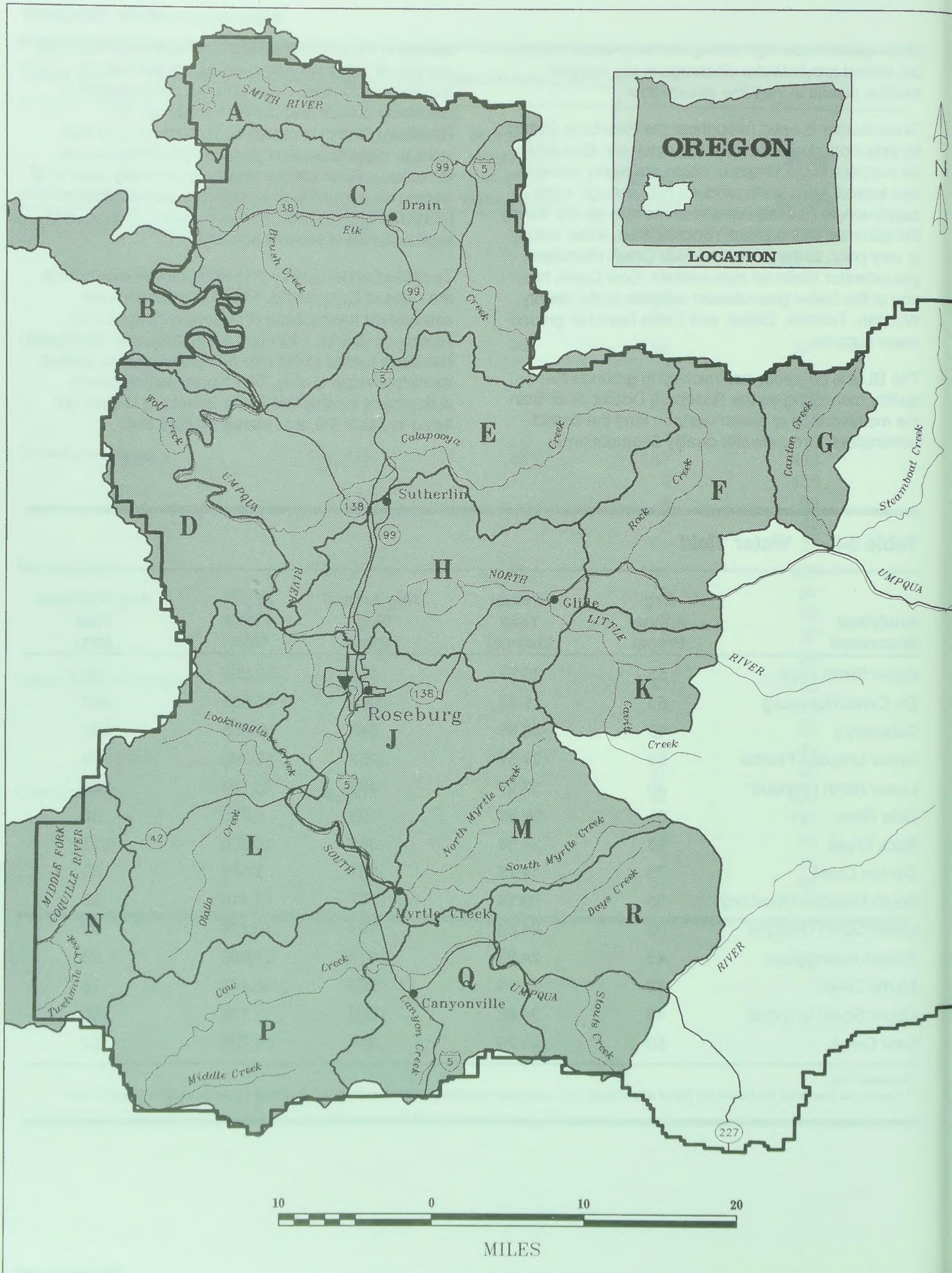
To protect water quality in their municipal watersheds, the cities of Canyonville, Riddle, and Drain have established memoranda of understanding with the Roseburg District. Likewise, a Special Land Use Permit has been issued to the City of Myrtle Creek to protect municipal water quality. The municipal/community watersheds located within the Roseburg District are listed in Table 3-9, and shows on Map 3-4.

Table 3-8. Water Yield

Analytical Watershed	Avg. Annual Precip	Annual Yield (inches)	Avg Annual Flow (cfs)	25 yr** Flood (cfs)	Avg Minimum Flow (cfs)
Upper Smith River	55	35.57	184	13,220	56
Elk Creek/Roseburg	50	25.50	658	45,585	357
Calapooya	45	30.65	648	35,655	342
Upper Umpqua Frontal	50	27.57	252	18,260	78
Lower North Umpqua*	40	37.97	473	18,720	206
Little River	55	35.98	195	8,935	66
Rock Creek	65	37.84	383	20,200	313
Canton Creek	75	44.15	201	9,075	65
South Umpqua/Roseburg	35	23.14	327	19,410	65
Lower South Umpqua	35	24.66	187	10,910	35
Olalla/Lookingglass	45	24.23	376	27,095	36
Myrtle Creek	40	23.14	203	12,440	76
Upper South Umpqua	40	24.66	289	17,720	55
Cow Creek	50	25.79	345	23,730	59

* regulated flow

** Twenty-five year flood discharges are based on acreages within analytical watersheds and not on predicted flood levels of major streams in watersheds.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Brush Creek
Creek
Wolf Creek
UMPQUA
RIVER
Calapooya
Creek
Rock Creek
Canton Creek
Steamboat Creek
UMPQUA
Sutherlin
NORTH
Glide
LITTLE
RIVER
Cavitt Creek
Roseburg
Lookingglass Creek
North Myrtle Creek
South Myrtle Creek
Days Creek
SOUTH
Olalla Creek
MIDDLE FORK COQUILLE RIVER
Twelvemile Creek
Myrtle Creek
Cow Creek
Canyonville
Canyon Creek
UMPQUA
Stouts Creek
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U.S. Department of the Interior
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ROSEBURG DISTRICT
1992 RMP/EIS

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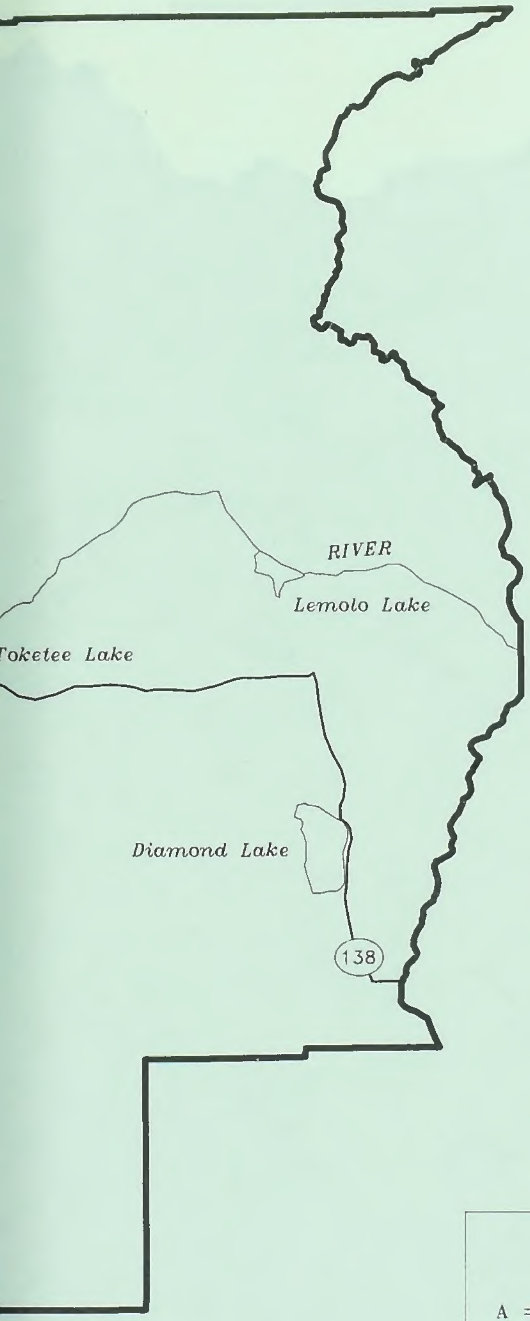


LEGEND

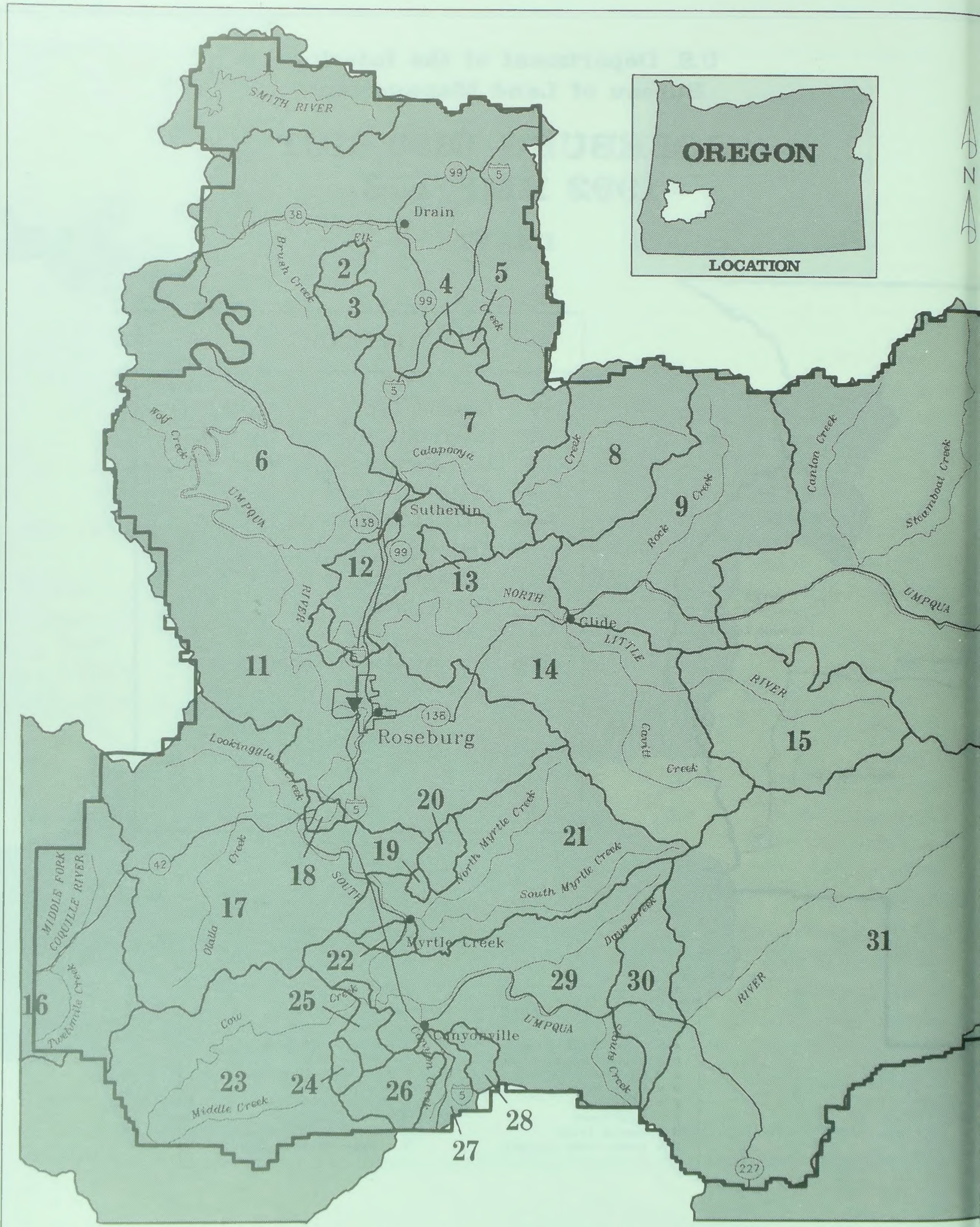
▼ District Office
5 Interstate Highway
199 U.S. Highway
46 State Highway
━ District Boundary
— Highway
— Stream
● Urban Area
• City
G Analytical Watershed

Analytical Watershed Key

A = Upper Smith River
B = Middle Umpqua Frontal
C = Elk Creek-Roseburg
D = Upper Umpqua
E = Calapooya
F = Rock Creek
G = Canton Creek
H = Lower North Umpqua

J = South Umpqua-Roseburg
K = Little River
L = Olalla-Lookingglass
M = Myrtle Creek
N = Middle Fork Coquille
P = Cow Creek
Q = Lower South Umpqua
R = Upper South Umpqua

MAP 3-3: ANALYTICAL WATERSHEDS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Drain
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Brush Creek
Creek
Wolf Creek
UMPQUA
RIVER
Calapooya
Sutherlin
Creek
Rock Creek
Canton Creek
Steamboat Creek
NORTH
UMPQUA
Glide
LITTLE
RIVER
Roseburg
Cavitt Creek
Lookingglass Creek
North Myrtle Creek
South Myrtle Creek
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MIDDLE FORK COQUILLE RIVER
Twelvemile Creek
Olalla Creek
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ROSEBURG DISTRICT
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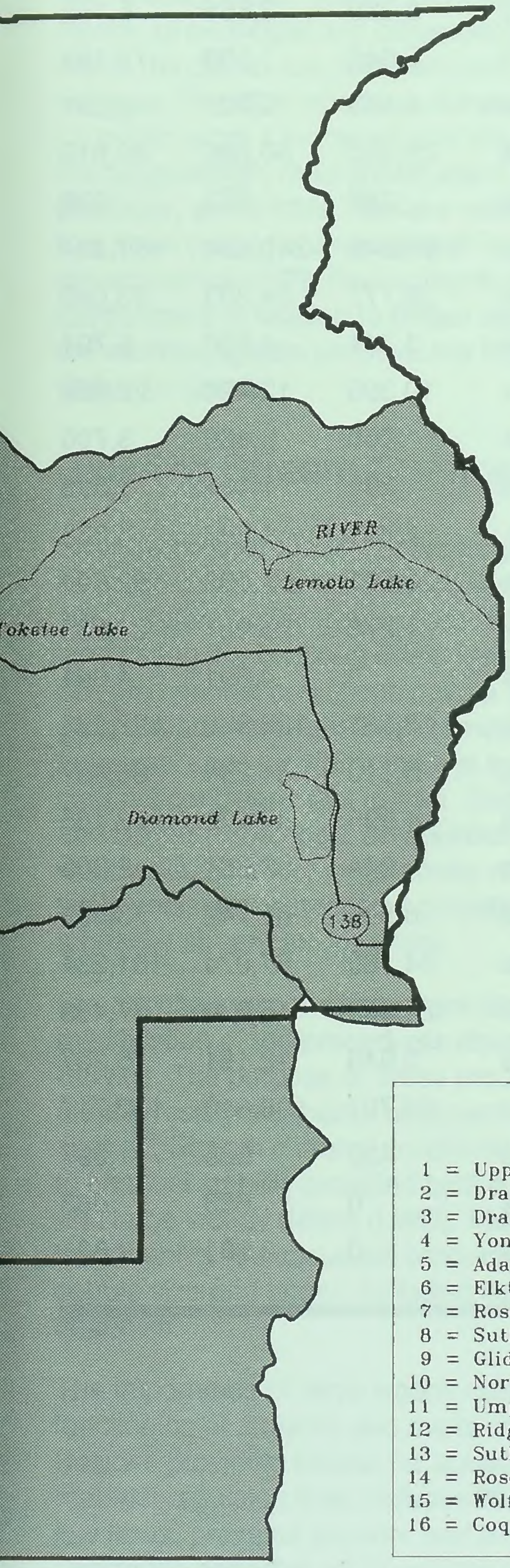


LEGEND

▼ District Office
5 Interstate Highway
199 U.S. Highway
46 State Highway
━ District Boundary
— Highway
— Stream
● Urban Area
● City
13 Community Watershed

Community Watershed Key

1 = Upper Smith River
2 = Drain-Bear Creek
3 = Drain-Billy Creek
4 = Yoncalla-Wilson Creek
5 = Adams Creek
6 = Elkton-Umpqua
7 = Roseburg-Oakland Cal
8 = Sutherlin-Calapooya
9 = Glide-North Umpqua
10 = North Umpqua-Susan Creek
11 = Umpqua Basin-North Umpqua
12 = Ridgewood-North Umpqua
13 = Sutherlin-Cooper Creek
14 = Roseburg/Winchester
15 = Wolfcreek-Jobcorps L
16 = Coquille River
17 = Winston-Dillard-South Umpqua
18 = Roberts Creek-South Umpqua
19 = Myrtle Creek Springs
20 = Clarks Branch-Bilger
21 = Clarks Branch-South Umpqua
22 = Myrtle Creek-South Umpqua
23 = Riddle-Cow Creek
24 = Riddle-Russell Creek
25 = Lawson Acres-Cow Creek
26 = Canyonville-W.F. Canyon Creek
27 = Canyonville-Canyon Creek
28 = Canyonville-O'Shea Creek
29 = Tri City-South Umpqua
30 = Milo Academy-South Umpqua
31 = Tiller Ranger Station
32 = Medford-Rogue River

MAP 3-4: COMMUNITY WATERSHEDS

Table 3-9. Municipal/Community Water Systems

Community System Name	Source Watershed	Population Served (Number)	Status of Filter	Watershed Area (Ac)		
				BLM	Other	Total
Drain, City of	Bear Creek, Allen Creek	1,200	Yes	1,423	2,973	4,396
Drain, City of	Billy Creek	1,200	Yes	2,695	4,613	7,308
Canyonville, City of	O'Shea Creek	1,100	Yes	2,289	2,866	5,155
Canyonville, City of	West Fork Canyon Creek	1,100	Yes	5,645	7,508	13,154
Canyonville, City of	Canyon Creek	1,100	Yes	6,569	2,722	9,291
Clarks Branch Water Assoc.	South Umpqua River	145	Yes	29,935	50,600	80,019
Clarks Branch Water Assoc.	Bilger Creek	145	Yes	285	553	838
Elkton, City of	Umpqua River	180	Yes	96,848	340,456	437,304
Glide Water Assoc.	North Umpqua River	1,000	Yes	38,777	54,303	93,080
Lawson Acres Water Assoc.	Cow Creek	55	Yes	3,341	4,550	6,791
Milo Academy	South Umpqua River, Lick Creek	310	Yes	10,396	12,490	22,886
Myrtle Creek, City of	South Umpqua River	3,245	Yes	250	3,480	3,700
Myrtle Creek, City of	Springbrook (5 Springs)	3,245	Yes	235	1,101	1,336
Riddle, City of	Russell Creek	75	No	1,791	1,592	3,383
Riddle, City of	Cow Creek	1,145	Yes	36,591	57,038	93,629
Ridgewood Water District	North Umpqua River	80	Yes	1,278	25,951	27,235
Roberts Creek Water District	South Umpqua River	5,500	Yes	0	4,691	4,691
Roseburg, City of Winchester	North Umpqua River WTP	24,000	Yes	18,363	108,860	127,223
Roseburg, City of Oakland	Calapooya Creek	6,000	Yes	5,213	61,244	66,457
Sutherlin, City of	Calapooya Creek	4,000	Yes	4,995	47,170	52,165
Sutherlin, City of	Cooper Creek	4,000	Yes	244	2,661	2,905
Tiller Ranger Station	South Umpqua River	100	Yes	10,590	62,742	73,332
Tri City Water District	South Umpqua River	3,000	Yes	34,160	67,074	101,234
Susan Creek Village	North Umpqua River	50	Yes	21,502	15,930	37,433
Wolf Creek Job Corps. Users	Little River	340	Yes	3,046	12,161	15,207
Winston Dillard Water Dist.	South Umpqua River	4,500	Yes	24,707	108,610	132,717
Yoncalla, City of	Adams Creek	815	Yes	432	665	1,097
Yoncalla, City of	Wilson Creek	815	Yes	0	683	683
Umpqua Basin Water Assoc.	North Umpqua River	5,000	Yes	0	2,801	2,801

On the Roseburg District, the North Umpqua River has been identified as eligible for consideration for wild and scenic status under the Wild and Scenic Rivers Act (Wild and Scenic Rivers). At present, however, there no "outstanding natural resource waters" on the Roseburg District.

Numerous domestic and irrigation water rights have been filed on and downstream from BLM-administered lands. These records are available through the Douglas County Water Master and Resources Office. Nearly all municipal and community water supplies within the district are obtained from surface water sources. The BLM operates numerous water sources on public lands it manages that are used primarily for fire suppression, road construction, forest spraying practices, and wildlife. Surface water quality monitoring has been carried out on several Roseburg District streams since 1979, measuring flow, turbidity, and temperature in relation to timber sale activities. Refer to the monitoring plan on file at the Roseburg District Office for details.

Existing Stream Channel Condition

Stream channel conditions are largely dependent upon the condition of the watersheds that they occupy. The 1988 Water Quality Status Assessment Report shows land use in the Umpqua Basin (see Appendix 3-4). Stream channel conditions have a significant effect on downstream water quality parameters and various beneficial uses for which there is no one set of stream channel conditions that is best. Stable stream banks and bottom substrates, an abundance of stable large woody debris, and a vegetatively recovered or relatively undisturbed riparian ecosystem are indicators of a healthy stream environment.

Stream channel conditions were assessed using a modification of the procedures developed by the Forest Service. The purpose of these procedures is to evaluate the resistive capacity of stream channels to change. Stream channel conditions are directly related to channel stability provided by the channel substrate and large woody debris (LWD). Many streams owe their stability to substantial amounts of substrate of cobble size and larger, including bedrock in their channels.

The importance of large woody debris to the proper functioning of streams and rivers cannot be overstated. Besides providing habitat for aquatic organisms this material regulates flow, reduces flooding, increases low flows, prevents erosion, and traps sediment. During the period of 1970 until the mid 1980s it was policy to remove woody debris from streams. For this reason many of the streams in all watersheds are lacking adequate large woody debris.

Stream channels have been affected to varying degrees by mining, timber harvest, and roadbuilding. Mining activities in the uplands in Thompson Creek in the Olalla/Lookingglass AWS have increased peak flows and sedimentation and have degraded stream channels. Road building has been the primary cause of landslides in many parts of the district.

Existing Upland Condition

Portions of most analytical watersheds have a high landslide potential attributable to soils, management history, rainfall characteristics, and topography. Most landslide susceptible areas are in the uplands and headwater seeps of subdrainages. Many of these areas have been identified and many more will be identified for each timber sale or road layout.

Forest Management activities such as mining, tractor logging, slash piling and roadbuilding can increase the water yield and peak flows (and consequently, sedimentation rates) in streams through compaction of soils (Table 3-11). The methods used to calculate the flows in Table 3-11 are based on methodology developed by the Forest Service. The effects of the riparian ecosystem on water resources are described in the riparian section of this chapter. Recreational activities, especially the use of off road vehicles (ORV), can also cause compaction and sedimentation. Heavy ORV use has contributed to water quality problems in some of the AWSs.

Existing Water Quality Conditions

In 1988, the Oregon State Department of Environmental Quality (DEQ) did an extensive inventory of water quality problems in the State. The results are reported in the Non-point Pollution Assessment Report. Water quality problems are encountered throughout Roseburg District AWSs (Appendix 3-5). Streams where a severe impairment of one or more beneficial uses was reported were designated as A1, while A2 streams are those where conflicting reports on water quality and beneficial use impairment have yet to be resolved. Streams designated as B are those where a moderate impairment of one or more beneficial uses was reported. The Roseburg District has 29 streams rated as A1.

Water quality is partially a function of location. Generally, watersheds that are farther away from Roseburg and at higher elevations are impacted more by forest management and less by agriculture or residential interface than lower valley areas closer to Roseburg.

The most commonly cited examples of beneficial use degradation are attributable to forest management; increased stream temperatures, lack of instream structure, and increases in stream sediment resulting from landslides, vegetation removal along streams and road location next to streams (Table 3-12). Conditions in these streams will improve if their riparian zones, uplands, and compacted areas are allowed to recover.

Other commonly cited examples of beneficial use degradation in watersheds are attributable to the residential interface and agriculture (Table 3-13). Impacts take the form of low dissolved oxygen, low flow levels, increased nutrients and bacteria/viruses, erosion, and turbidity. Grazing impacts are substantial in unfenced or poorly fenced riparian areas where riparian vegetation and bank stability is greatly reduced through trampling, high animal waste nutrient inputs, and instream dissolved oxygen is depleted. Agriculture also contributes the negative effects of herbicides and pesticides.

The residential interface contributes to the low flow problem where a substantial proportion of base flow is removed and where riparian vegetation is removed for development. Problems related to agriculture and the residential interface have the effect of compounding those problems originating from forest management upstream. Conditions are likely much worse in these lowland reaches where these cumulative impacts are exerted upon a greater range of water quality parameters.

Cumulative impacts in the Roseburg District occur where impacts in lower reaches of streams compound impacts that continue from upstream. The South

Table 3-11. Flow information for analytical watersheds on the Roseburg District

Analytical Watershed	Level of Compaction	Average Annual Flow (cfs)	25 Yr. Flood (cfs)	Average Min. Flow (cfs)
Upper Smith River	L	184	13,220	56
Elk Creek	H	658	45,585	357
Upper Umpqua Frontal	L	252	18,260	78
Calapooya	M	648	35,655	342
Lower North Umpqua	M	473	18,720	206
Rock Creek	L	383	20,200	313
Canton Creek	L	201	9,075	65
Little River	M	195	8,935	66
Myrtle Creek	M	203	12,440	76
Upper South Umpqua	M	289	17,720	55
Lower South Umpqua	H	187	10,910	35
Cow Creek	M	345	23,730	59
South Umpqua	M	327	19,410	65
Olalla/Lookingglass	H	376	27,095	36
Middle Fork Coquille*	M	750	20,430	26

* This analytical watershed is in the South Coast Basin. Most of it lies in the Coos Bay BLM District.

L = Low compaction levels are predominant in watersheds where steep terrain and management preference has favored cable logging methods. Likewise, agriculture and the residential interface are typically not associated with these areas.

M = Medium compaction levels are most often associated with watersheds that have been subjected to a variety of land uses and a mixture of high and low compaction activities.

H = High compaction levels predominate in watersheds that have been subjected to intensive ground-based logging and the residential interface and agriculture. Vegetative recovery in these watersheds is impeded by urbanization and heavy compaction of the soil.

Umpqua River has particularly persistent water quality problems and as a result of numerous beneficial use impairments, total maximum daily loads (TMDL) of pollutants have been established. TMDLs are the maximum amount of pollution a particular waterbody can absorb in a day without exceeding established water quality standards, thereby becoming unhealthy or unusable for some beneficial uses. TMDLs and other limits on water pollution are essentially limits on human activities in a watershed. This means that setting TMDLs can force reductions in or even moratoriums on home building, road construction, timber and crop harvesting, industrial development, as well as other activities in the affected watershed.

The Roseburg BLM has been involved in monitoring streams across the district since 1979. Roseburg BLM has a cooperative agreement with Douglas County for the monitoring of six stream flow gauges and five thermographs. Roseburg BLM also has personnel monitoring sediment and temperature at numerous locations throughout the district in relation to timber sale activities. Refer to the Record of Decision (ROD) Monitoring Plan for details (USDI,BLM,Roseburg District Office (ROD) 1983). The following is a general discussion of water quality monitoring on the district.

Temperature - Many of the larger creeks and rivers on the district have maximum summer temperatures that are above basin water quality criteria. These criteria do not allow any increases in temperature if the natural temperature is above 58° F. in the Umpqua Basin. Streams monitored for temperature by the Roseburg District are as follows: in the Upper Smith River AWS: Upper Smith River; in the Rock Creek AWS: North Umpqua River above Rock Creek; in Canton Creek AWS: Canton Creek (2), Pass, Call, and King Creeks; in Upper South Umpqua AWS: Middle Fork Deadman Creek (3). Data have not yet been summarized into a report but will be made available during the life of this RMP.

Dissolved Solids - Dissolved solids are a problem in some Roseburg District streams (Appendix 3-5). High levels are indicative of turbidity and pollution.

Bacteria - District streams impacted by the residential interface and agriculture have problems with bacteria and viruses (Appendix 3-5). This is due in part to the removal of flows that would normally dilute the increased agricultural nutrient loads.

Table 3-12. Stream segments on the Roseburg District with any of temperature, structural or sediment problems related primarily to forest management

Analytical Watershed	Stream Segment (DEQ, 1988)
Upper Smith River	Upper Smith River
Elk Creek	Upper Elk, Folley, Pass Creeks
Upper Umpqua Frontal	Wolf Creek
Calapooya	Upper reaches
Rock Creek	North Umpqua River, East Fork, Upper,Lower Rock Creek
Canton Creek	Lower Canton Creek
Little River	Little River, Fall, Cavitt Creeks
Upper South Umpqua	Upper Deadman, Coffee, Stouts Creeks*
Cow Creek	Middle Creek
Olalla/Lookingglass	Thompson Creek **

*Data are not available for Stouts Creek

**Impacts are related to mining and consequent disturbance of upland and streamside vegetation.

Table 3-13. Stream segments on the Roseburg District with any of the following problems associated with agriculture, the residential interface, and forest management: low dissolved oxygen, low flow levels, pesticides, increased nutrients and bacteria/viruses, erosion, and turbidity

Analytical Watershed	Stream Segment (DEQ, 1988)
Elk Creek	Middle, Lower Elk Creek
Upper Umpqua Frontal	Lower Hubbard Creek
Calapooya	Middle, Lower reaches
Lower North Umpqua	Cooper, Sutherlin Creeks
Myrtle Creek	Upper and Lower North and South Myrtle Creeks
Upper South Umpqua	Days Creek
Lower South Umpqua	South Umpqua River, Canyon, O'Shea Creeks
Cow Creek	South Umpqua River, Cow, Ash Creeks
South Umpqua/ Roseburg	South Umpqua River, Deer, Oak, Roberts, Clark Branch
Olalla/Lookingglass	Thompson, Kent, Porter, Willis, Rice

Turbidity and Sediment - Sediment (usually bedload) is a problem on Roseburg District streams (Appendix 3-5). There is no state standard for suspended sediment. The criteria for turbidity allows no more than a 10 percent cumulative increase in natural stream turbidities, as measured relative to a control point immediately upstream of the turbidity causing activity. Both mass soil movement (landslides) and surface erosion are sources of sediment throughout the Roseburg District.

General Watershed Condiiton

The general condition of a watershed refers to its ability to function in a way that will deliver a regulated amount of high quality water. Indicators of a healthy watershed generally include such things as deep permeable soils, healthy riparian ecosystems, abundant vegetation, and a lack of pollution sources. Watershed condition indices were derived for district AWSs by rating each of the parameters that are known to affect watershed conditions in Western Oregon (Appendix 3-6). The method and rational for deriving the watershed condition index is (WCI) documented in Appendix 3-6.

Watershed Condition Index

According to the watershed condition index (WCI), watershed conditions on the Roseburg District vary widely (Figure 3-1). Elk Creek is the only watershed in extremely poor condition. The remainder are relatively closely grouped. As watershed condition and water quality are related, so are WCI rating and number of impaired streams (Appendix 3-6). The following is a discussion of AWSs, their WCI ratings, and the applicability of their ratings to actual present condition in March 1992.

The WCIs are partially a function of land management. Urban and agricultural (nonforest) lands are usually in a poorer watershed condition than forest lands. This is due to industrial waste, urban runoff, heavy use of agricultural pesticides, heavily compacted soils, agricultural and urban withdrawals, paved land, sewage, lack of vegetation, and the channelization of streams and rivers.

The results of the poorer watershed conditions are increased flood frequencies, lower summer flows, higher maximum stream temperatures, increased sediment loads, and higher levels of toxic pollution than in forest lands. Sedimentation, although a major pollutant from forest lands, is highest in AWSs with the highest proportion of urban and agricultural lands. On the Roseburg District these include Elk Creek, Calapooya, South Umpqua, Lower South Umpqua, and Olalla/Lookingglass.

The WCIs are also partially a function of climatic and geologic (geomorphic/topographic) characteristics. Another common factor in AWSs with high or problem WCI is that gentle topography has allowed the use of tractors for logging, site preparation, and conversion of forests to pasture. Lower South Umpqua and Olalla/Lookingglass are prime examples of these areas where compaction levels and potential for increased peak flows are high. Low summer flows are a problem in both AWSs due to geology and agricultural withdrawal.

Umpqua Mariposa Lily
Photo by Russ Holmes

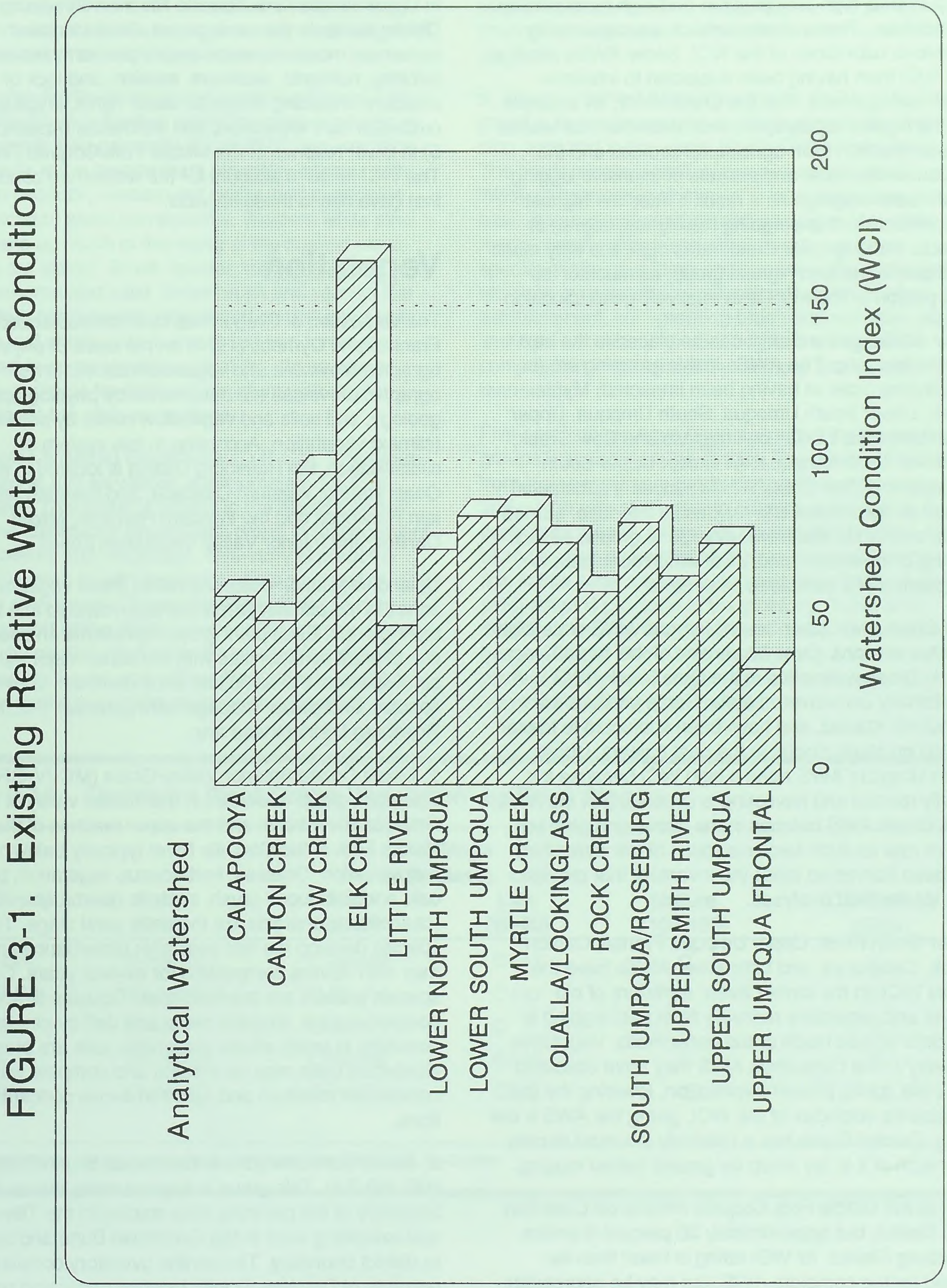


Figure 3-1 Watershed Condition Index

Many AWSs contain a relatively high proportion of steep slopes, high precipitation, and high susceptibility to landslides. These characteristics are captured in numerous subindices of the WCI. Some AWSs attain a high WCI from having been subjected to intensive forest management. The Elk Creek AWS, for example, has the highest topographic WCI subindices as well as high compaction from agricultural sources and the residential interface, and pockets of intensive logging (often cable logging). As a result it rates the highest WCI, reflective of undergoing the highest degree of impacts. Although, Elk Creek rates high, it is very much like those in the next highest group, as much of the west portion of the AWS is in relatively good condition.

Many AWSs on the district can be placed in the next highest grouping. The AWSs in this grouping are (in descending order of having been impacted) Myrtle Creek, Lower South Umpqua, South Umpqua, Upper South Umpqua, Olalla/Lookingglass and Cow Creek, and lower North Umpqua. All except Upper South Umpqua and Cow Creek AWSs include a substantial portion of agricultural and residential interface, burned lands, and lands that have undergone ground based logging in the recent past, all of which contribute to compaction and increased peak flows.

Cow Creek and Upper South Umpqua AWSs rate high for other reasons. Over 80 percent of the 16,000+ acre Middle Creek watershed in the Cow Creek AWS is in a vegetatively unrecovered state. Some portions are intensively roaded, and have been subjected to tractor logging on steep slopes in the past 5 years. Upper South Umpqua AWS rates a high WCI because it is heavily roaded and havesting is continuing in the AWS. Rock Creek AWS belongs in the above grouping but did not rate as such because much of the watershed has been harvested since the inventory that provided data for the WCI analyses.

Upper Smith River, Upper Umpqua Frontal, Canton Creek, Calapooya, and Little River AWSs have the lowest WCI. In the former three, a mixture of old-growth and vegetative recovery from past logging is complete across much of the watersheds. Vegetative recovery in the Calapooya AWS may have obscured skid trails during photointerpretation, lowering the soil disturbance subindex of the WCI, giving the AWS a low rating. Canton Creek has a relatively low road density and much of it is too steep for ground based logging.

Most of the Middle Fork Coquille AWS is on Coos Bay BLM District, but approximately 20 percent is on the Roseburg District. Its WCI rating is lower than expected for the complete AWS, but may be appropriate for the Roseburg portion. The WCI Subindices failed to account for agricultural and residential impacts in the lower portion of the watershed. Oregon DEQ (1988) identifies moderate sediment impacting coldwater fish in Upper Middle Fork Coquille River on Roseburg District lands. In the same report, DEQ identified numerous moderate water quality problems including turbidity, nutrients, sediment, erosion, and lack of structure impacting domestic water rights, irrigation, coldwater fish, recreation, and aesthetics (Appendix 3-5) in lower reaches of the Middle Fork Coquille River. The WCI failed to account for the watershed conditions that gave rise to these impacts.

Vegetation

The vegetation of Oregon has been characterized by Franklin and Dyrness (1973) on the basis of physiographic provinces and vegetation zones. Physiographic provinces are determined by physiography, geology, and soils and vegetation zones by potential (climax) vegetation. According to this system of classification, the Roseburg District is located in the Coast Range, Western Cascade, and Klamath Mountain Provinces and the Western Hemlock, Mixed Conifer, and Interior Valley Vegetation Zones.

Upland vegetation occurring within these vegetation zones in the planning area has been divided into five plant groups. Each plant group represents an association of plant communities with the same major early seral species, the same late seral dominant conifer species, and similar management potential. For the Roseburg District these are:

1. Mixed Conifer/Interior Valley/Grass (MC-IV-GR). This plant group is located in the interior valley of the Umpqua River basin and the upper reaches of the Middle Fork of the Coquille River typically below 1,500 feet elevation. Grasses, herbaceous vegetation, poison oak, and deciduous brush, such as deerbrush (ceanothus), characterize the early seral stage. These species develop the first year after disturbance and may offer severe competition for several years. Conifer species present are predominately Douglas-fir and ponderosa pine. Incense cedar and Jeffrey pine may dominate in areas where serpentine soils are present. Hardwood trees may be present and compete with conifers for moisture and light if in dense concentrations.

2. Mixed Conifer/Madrone-Deciduous Brush/Salal (MC-MB-SA). This group is located along the southern boundary of the planning area starting in the Tiller area and extending west to Big Dutchman Butte and south to district boundary. The conifer overstory consists primarily of Douglas- fir with incense cedar and ponderosa pine prevalent in some areas. Brush species include ocean spray, poison oak, and deerbrush. Salal occupies cooler sites. Golden leaf chinquapin occurs in

both shrub and tree forms along with canyon live oak on drier sites. Varnish leaf ceanothus is at times the dominant shrub species during the early seral stages in the western portion of this plant group.

3. Douglas-fir/Rhododendron-Ceanothus/Salal (D-CE-SA). This group is located along the eastern portion of the planning area generally above 2500 feet elevation. Douglas-fir is the predominant overstory species with western hemlock, western red cedar, and sugar pine as associated stand components. Western white pine may make up much of the stand at the highest elevations in the district. Brush species include Pacific rhododendron and salal. Snow brush and varnish leaf ceanothus can become established on disturbed sites. Golden leaf chinquapin in shrub and tree forms is prevalent in some localities. All of the above brush species compete for light and moisture with conifer seedlings in the early seral stage.

4. Douglas-fir/Mixed Brush/Salal (D-B-SA). This group is located at mid elevations approximately 1,500 to 2,500 feet. This group is similar to the Mixed Conifer/ Madrone-Deciduous Brush/Salal group in management requirements and responses. Overstory is predominately Douglas-fir with incense cedar and grand fir present over most of the range. Big leaf maple may make up part of the stand component and may sprout vigorously on disturbed sites. Brush species include ocean spray, hazel, and willow. Red alder is usually found in drainages where streams provide adequate moisture. Moisture is normally not a limiting factor and sites are usually resilient to fire. Light is the principle limiting factor to conifer establishment in the early seral stage.

5. Douglas-fir/Red Alder/Vine Maple (D-RA-VM). This group is located along the western edge of the planning area and in the upper South Smith River drainage. The predominate overstory species is Douglas-fir. Western hemlock is dominant in localized areas. Red alder is found in drainages and on wetter sites. Vine maple, hazel, willow, and other deciduous brush species make up a large component of the understory. Moisture is ordinarily not a limiting factor to conifer establishment, but sprouting brush and red alder may limit light necessary for conifer growth. Vegetation composition is influenced by onshore flow of moist marine air.

Five seral stages have been described for the plant groups that occur on the district. The general trend is from high net primary productivity with low biomass and a high rate of change in species composition in early seral stages, to low net primary productivity, high biomass, and a low rate of change in species composition in late seral stages. A detailed description of each seral stage is provided in the glossary. Table 3-14 displays the dominant vegetation of each plant group by seral stage. Table 3-15 displays the acres of each plant group by seral stage. Figure 3-2 displays the location of the five plant groups.

Table 3-14. Dominant Plant Group Vegetation[1] by Seral Stage

	Seral Stage (Age Class)				
Plant Group	Early (0-10)	Mid (20-40)	Late (50-90)	Mature (100-190)	Old Growth (200+)
MC-IV-GR	G-He-Sh	C-Sh-Hd	C-Hd	C	C
MC-MB-SA	He-Hd-C	C-Sh-Hd	C-Hd	C	C
D-CE-SA	Sh-He	C-Sh	C	C	C
D-B-SA	Sh-He-Hd	C-Sh-Hd	C-Hd	C	C
D-RA-VM	Sh-He-C	C-Hd-Sh	C-Hd	C	C

[1] Seral Vegetation: G=Grass, He=Herb, Sh=Shrub, Hd=Hardwood, C=Conifer

Table 3-15. Acres of Each Plant Group by Seral Stage

Plant Group	Seral Stage (Age Class) Early (0-10)	Mid (20-40)	Late (50-90)	Mature (100-190)	Old Growth (200+)
MC-IV-GR	39,955	32,363	14,630	38,206	34,628
MC-MB-SA	12,231	5,572	4,420	6,591	17,138
D-CE-SA	10,389	6,458	3,756	10,432	21,768
D-B-SA	21,417	22,475	9,282	18,790	27,217
D-RA-VM	11,301	16,367	7,127	12,777	14,505
Total Acres	**95,293**	**83,235**	**39,215**	**86,796**	**115,256**
Total Percent	**23**	**20**	**9**	**21**	**27**

Riparian vegetation is restricted to areas adjacent to intermittent or perennial water such as lakes, ponds, rivers, and streams. Composition varies depending on the composition of surrounding upland vegetation, soil characteristics, and hydrology. Riparian areas are generally more complex than adjoining upland plant communities due to the presence of larger trees, greater diversity of species, more large woody debris, and greater structural diversity. Herbs and shrubs are typically more abundant than in adjacent upland communities. Black cottonwood, Oregon ash, and California laurel are common at lower elevations. An association of common sword fern and Oregon wood sorrel in the understory and western hemlock and western red cedar in the overstory is characteristic at higher elevations. Wildlife habitat values of riparian areas are discussed in the Animals section of the EIS. The location, acres, and condition of riparian areas are listed in the Water Resources section.

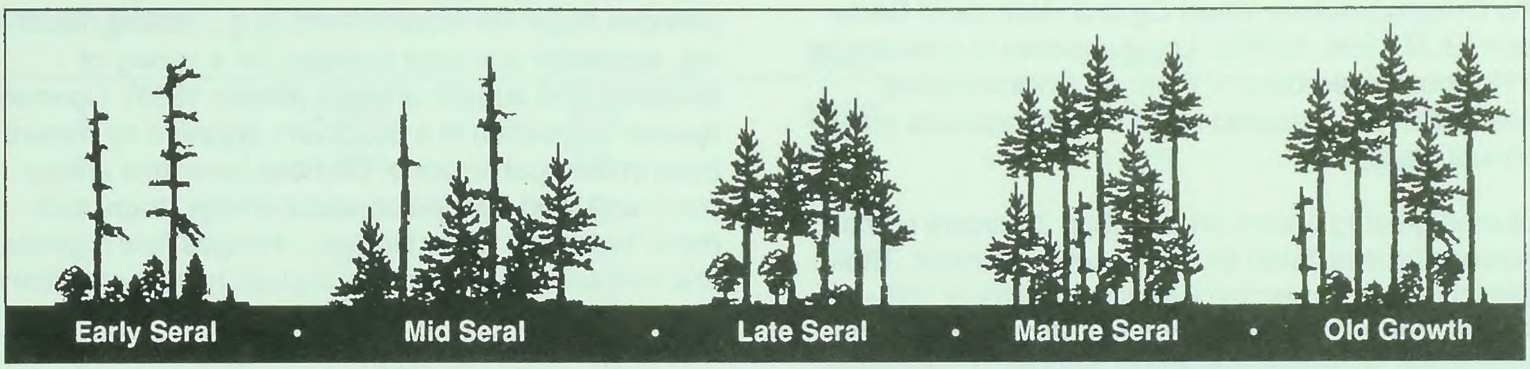
Wetland vegetation is often distinct from riparian vegetation. Wetlands occur in areas where the water table is at or near the soil surface for extended periods and which contain hydric soils. Forested wetlands support tree species such as Oregon ash, red alder and western red cedar and are often associated with skunk cabbage. Nonforested wetlands support shrubs such as willow and spirea and herbaceous plants such as horsetails, rushes, sedges, grasses, and cattails plus a wide variety of showy flowering plants such as arrowleaf groundsel, checker mallow, black head, and tiger lily. Wildlife habitat values and water quality values are discussed in the Animals and Water Resources sections of the EIS. The amount and distribution of wetlands in the planning area is unknown.

Aquatic vegetation is restricted to areas of free flowing or standing water and occur in the form of floating plants, such as pondweed and duckweed, submersed plants, such as white water-buttercup and bladderwort, and emergent plants, such as cattail, rushes, and sedges. Most of the district's aquatic vegetation is found in artificial reservoirs and in rivers and streams. There are few natural lakes and ponds. Two undisturbed permanent ponds which support aquatic vegetation typical of the planning area have been proposed as an Area of Critical Environmental Concern. A detailed account of the area, known as the Red Ponds Proposed ACEC/RNA, is provided in the Special Areas section of the EIS.

Other types of vegetation found in the planning area occur in unique ecosystems, also referred to as special habitats. Special habitats include serpentine barrens, bogs, meadows, rock cliffs, and talus slopes. They often support unusual or unique vegetation communities and are managed as special status plant or animal habitat or as special areas. Special habitats that are managed as special status plant or animal habitat are managed for the benefit of the special status species. Special habitats located in special areas are managed as Areas of Critical Environmental Concern. The amount and distribution of special habitats in the planning area is unknown.

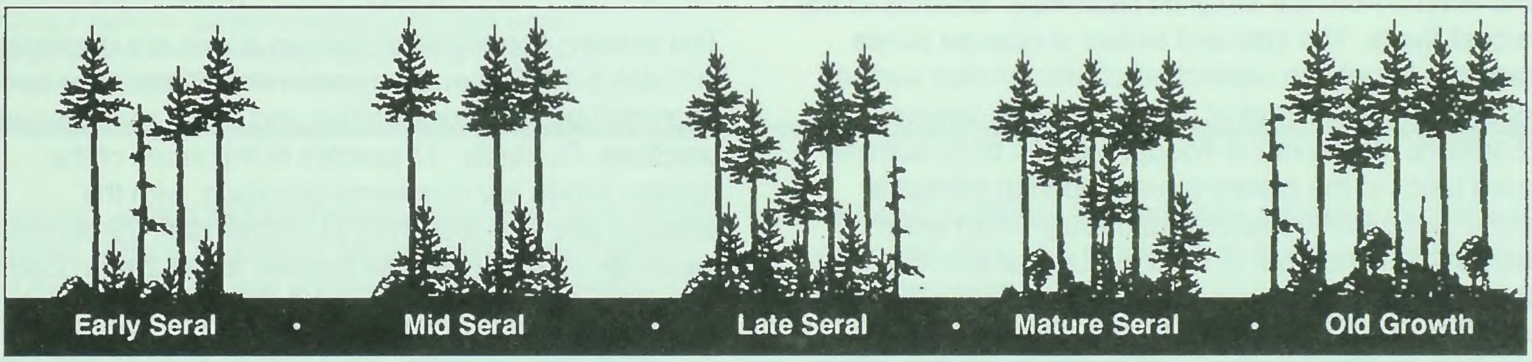
Noxious weeds are specific plant species considered undesirable, troublesome, and difficult to control. They occur on both forest and nonforest lands in the planning area. Noxious weeds are classified as priority 1 (potential new invaders), priority 2 (possible to eradicate), and priority 3 (established populations which

Natural, Catostrophic Stand Replacement



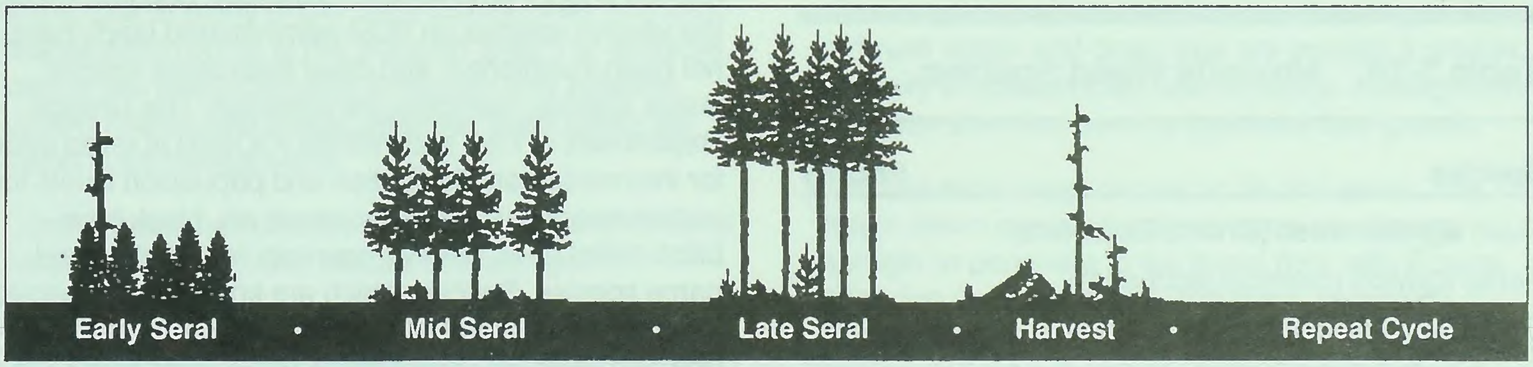
The first seral stage consists of dead trees, down trees, forbs, brush, and conifer seedlings (and a very few living trees) which serve as a seed source. Succession progresses in a more or less even-aged sequence, with vertical and fine grained diversity developing in the mature seral stage and being fully expressed in the old-growth stage.

Natural, Partial Stand Replacement



This successional path is very common in southwestern Oregon and more common to the north than previously imagined. The first seral stage consists of a patchwork of surviving green overstory trees, dead trees and down trees. Patches contain young conifers, forbs, and hardwoods. Development is uneven-aged and patchy with vegetation developing in the understory and in patch openings, while overstory trees slowly die, turn into snags and fall.

Even-age Managed Forest



This successional path begins after nearly complete removal of conifer volume in logging, leaving a few snags and a small amount of down wood. Development is even-aged and is truncated by harvest in short rotations.

Figure 3-2 Seral Stages

may be capable of control or being prevented from further spread). Table 3-16 shows the major species of concern within the planning area.

Management of noxious weeds is in accordance with the Oregon Noxious Weed Control Records of Decision (BLM 1986, 1987a). Local direction is provided by a Noxious Weed Control Plan. An Environmental Assessment is prepared for all control activities on an annual basis.

Leased grazing occurs on less than 3 percent of the acreage administered by the Roseburg District. The district grazing program currently consists of 765 Animal Unit Months (AUMs) on 11,871 acres. There have been no known significant impacts to vegetative communities in the past due to grazing on Roseburg district administered lands.

Riparian Zones

Riparian zones occur throughout drainage systems and extend from the smallest headwater streams to the largest rivers. The size and extent of riparian zones depends largely on watershed characteristics such as topography, soils, rainfall, water quantity, stream conditions, and width of floodplains. On BLM-administered lands in the planning area, riparian habitat is found along 837 miles of third through ninth order streams. The number of third through ninth order stream miles by watershed is shown in Table 3-7 (see Water Resources section). Riparian acres comprise 4.5 percent of the land base or 18,880 acres (see Table 3-17) and riparian vegetation along small, perennial third order streams makes up 45 percent of the these stream riparian acres.

A high level of terrestrial and aquatic diversity and primary habitat for several wildlife species are found in mature riparian zones. Mature riparian vegetation (i.e., average tree size greater than 21" dbh) has the structural components to maintain water quality, lessen peak flood flows, control erosion, and increase groundwater recharge. Standing riparian vegetation helps regulate water temperature through shading and provides major life requirements (e.g., nesting, roosting, and cover and food sources) for a variety of terrestrial and aquatic animals (Brown 1985). Downed riparian vegetation in a floodplain, supplied by mature trees in the riparian zone, provides terrestrial animal cover and food, dissipates water energy, traps sediment, increases water storage, changes flow patterns, and maintains and improves aquatic habitat conditions.

Table 3-16. Noxious Weed Species.

Species	Priority
Rush skeletonweed (Chondrilla juncea)	2-3
Tansy ragwort (Senecio jacobaea)	3
Gorse (Ulex europaeus)	3
Canada thistle (Cirsium arvense)	3
Scotch broom (Cytisus scoparius)	3
St. Johnswort (Hypericum perforatum)	2-3

Under natural conditions, conifers (western redcedar, hemlock, and Douglas-fir) dominate riparian overstories in small V-shaped drainages, while deciduous trees (red alder, bigleaf maple, black cottonwood, and Oregon ash) gradually become more dominant in overstories as streams increase in size. Understory trees (vine maple), herbs, and shrubs are generally more abundant in riparian areas than in upland communities. (See Figure 3-3.)

The existing conditions of riparian zones are displayed in Table 3-17. Generally, riparian conditions have been degraded by road construction and forest management practices. Currently, 37 percent of the acres of the riparian zones are in minimal condition, with the average tree size less than 11 inches dbh, 29 percent are in fair condition and 34 percent acres are in good to optimal condition. Riparian habitat in smaller intermittent streams are not protected and have a higher percentage of acres in minimal condition.

Wildlife

An estimated 298 vertebrate wildlife species which includes mammals, birds, reptiles and amphibians, are known or suspected to exist within the Roseburg District. This includes 70 mammals, 191 birds, 18 reptiles and 19 amphibians. Generally, populations of the various species on BLM-administered lands have not been inventoried, and other than some special status species, numbers are unknown. The Oregon Department of Fish and Wildlife (ODFW) is relied upon for information on distribution and population levels for certain species, such as roosevelt elk, black bear, black-tailed deer, turkey, mountain lion, and upland game species. Species which are known or suspected to obtain at least one of their life requirements (i.e., breeding, feeding, or resting) within the various seral stages and unique habitat types in the planning area are shown in Appendix 3-8. This RMP focuses on priority wildlife species including special status species and several other important species. Special status

Table 3-17. Existing conditions of riparian zones on BLM-administered lands. Acres of each condition class[1] by stream order.

Stream Order	1 (min.)	2 (min.)	3 (fair)	4 (good+)	Total
3	2,595	675	1,439	3,749	8,458
4	1,490	391	1,530	1,825	5,236
5	1,080	169	1,118	766	3,133
6	346	75	787	2	1,210
7	125	27	507	0	659
8	19	12	33	1	65
9	5	9	104	1	119
Total:	**5,660**	**1,358**	**5,518**	**6,344**	**18,880**

[1] Riparian condition class equates to size of trees (dbh) in riparian zones:
Class 1 (minimal condition) = 0-5 inch trees
Class 2 (minimal condition) = 5-11 inch trees
Class 3 (fair condition) = 11-21 inch trees
Class 4 (good to optimal condition) = 21+ inch trees
(see Appendix 3-7 for explanation of rating system)
Source: District timber inventory

species, which include federal threatened and endangered, federal proposed, federal candidate 1 and 2, state threatened and endangered, BLM sensitive, and Oregon Natural Heritage Program listed species defined as BLM assessment, are dealt with in the Special Status Species section. This wildlife section covers other priority species including important game species and other species considered vulnerable to impact from management activities. A list of these species is provided in Table 3-18 along with information on habitat affinities and population levels.

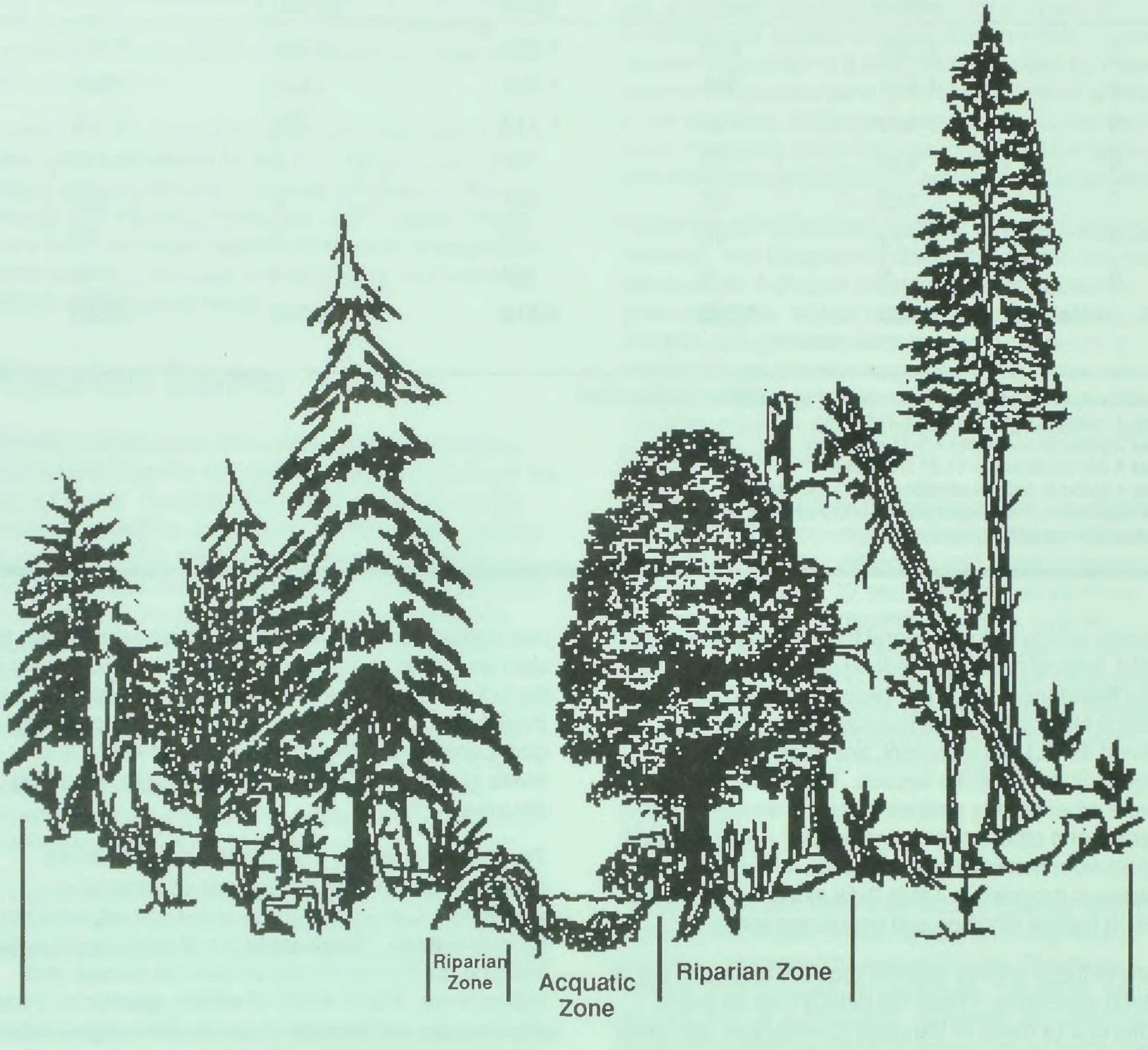
Each of these priority species requires a specific set of habitat conditions. These conditions may be found within one or many of the plant communities and seral stages which occur in the planning area. For example, osprey are found primarily in riparian and adjacent upland forests with snags, whereas black bears are found in six habitat types.

Conifer forest habitats are discussed below in terms of seral stage: early, mid, mature and old age.

The early seral stage provides a range of conditions from initial grass-forb through shrub to shrub-sapling phase. Approximately 95,293 acres are currently in the early phase. Naturally created early seral stage could have an abundance of snags and dead woody material whereas these components are typically greatly reduced on timber harvest sites. Forage production for deer and elk is at a peak during this stage, declining in the latter years as the conifer canopy closes. The availability of increased forage production for all big game species is influenced by road densities and levels of use, size of openings, and slash remaining on the area.

The mid seral stage is characterized by a closed canopy condition and an absence of understory vegetation. Currently 183,235 acres are estimated to be in this stage. These areas are of minimal value for foraging but the dense stands provide escape and hiding cover. The diversity of wildlife species on these sites is quite low in comparison to other stages. When remnant snags and down logs are present a greater diversity of species may use the areas. Management on these sites has been to maximize tree growth.

The late seral stage occurs on 39,215 acres. The forest crown canopy begins to open up allowing sunlight to penetrate to the forest floor with a corresponding increase in forb and shrub vegetation. Natural tree mortality and thinning on the stand begin to increase snag levels above earlier seral stages. Where legacies of previous old-growth stands remain such as large snags, larger trees and large down logs, the forest can provide habitat for species associated with mature and old-growth forest.



[1] Varies by Alternative.

Figure 3-3 Riparian Areas - Vegetation Type

The mature seral stage (usually stands between 100-200 years of age) begins to diversify in stand structure both vertically and horizontally. Large trees and snags, down and decaying trees, and openings provide a variety of niches for wildlife. Openings in the canopy as a result of tree mortality from disease, insects or windthrow allow increased ground cover of forbs and shrubs. The increased diversity in vegetative cover results in greater feeding and breeding opportunities for a variety of wildlife species. Approximately 86,796 acres of the Roseburg District are in this seral stage. Current management constrains harvest on a portion (33,210 acres) of the stands in this seral stage by prescribing a 250 year rotation.

Old-growth forest, typically stands 200 years or greater in age, comprise 115,256 (27 percent) of the total acres within the Roseburg District. Prominent features of these stands include trees large in both diameter and height, multi-layered tree canopies, large snags and cull trees, down decaying logs, and small forest openings. These features provide breeding and feeding habitat for a variety of wildlife species. For example, the forest canopy and downed logs provide a climate controlled habitat for small mammals like red-backed voles and amphibians such as salamanders and the multi-layered canopy provides cover and small openings for foraging particularly during inclement weather or heavy snow events. Large snags and spike topped trees are particularly important on sites adjacent to major river systems and valley fringes as nest sites and associated perches for osprey, golden eagle, red-tailed hawk, and bald eagle.

In addition to the conifer forest seral stages described above, other habitats within the planning area have been adversely impacted by forest management on district lands. These habitat components and habitats include snags, dead-and-downed wood, stream/riparian zones, cliffs and talus slopes, meadows,

Table 3-18 Priority Animal Species[1]

Species	Reason For Priority	Primary Habitat[2]	Population Level/Trend[3]
Osprey	HI[4]	f,h	Moderate/Increasng
Golden Eagle	HI	a,b,d,e,g,h	Low/Stable
Dominant Woodpeckers[5]	HI	a,d,e,f,h,j,k	Low/Decreasing
Black Bear	Game	a,b,c,d,e,f,j	Moderate/Stable
Mountain Lion	Game	a,b,d,f,g	Low/Stable
Roosevelt Elk	Game	a,b,c,d,e,f	Low-Moderate/Stable
Black-tailed Deer	Game	a,b,c,d,e	High/Stable
Wild Turkey	Game	a,b,f,k	Moderate/Increasing

[1] Does not include special status species

[2] Primary habitat includes breeding, feeding or resting sites within the following seral stages and special habitats (after Brown 1985):
a = early seral
b = mid seral
c = late seral
d = mature
e = old-growth
f = riparian
g = talus slope/cliff
h = snags
i = coastal
j = dead and downed
k = hardwood

[3] Determined by district biologist based on field observations and consultation with other agencies. Population levels of many wildlife species are difficult to determine and therefore must be considered estimates only.

[4] HI = High interest and concern (species considered vulnerable to impacts from management activities.)

[5] Includes Downy and Hairy Woodpeckers, Northern Flicker, and Yellow bellied Sapsucker.

BLM Fisheries habitat enhancement project

wooded swamps, and hardwood stands. There are currently over 150,000 acres of forest land in the district with no or very low levels of useable snags present.

Snags are of special concern, because they provide primary habitat for 52 species of birds and mammals (Appendix 3-8). Priority species which use snags as primary habitat are the dominant woodpeckers. Cavity-nesting birds, including woodpeckers and secondary cavity users, feed on insects and play an important role in control of forest insect pests (Brown 1985). Under natural conditions, snags occur throughout the forest as trees die due to natural suppression, fires, insects and disease. However, logging and current safety and fire prevention measures have resulted in the elimination of most snags on timber harvest units. Current populations of the five dominant woodpeckers (hairy, downy, pileated, red-breasted sapsucker, and northern flickers) on BLM-managed lands within the planning area are estimated by district biologists at 50 percent of potential (based on criteria from Brown, ed. 1985). Most private land harvested in the past 15-20 years have very few wildlife trees remaining. Seven species of cavity users (house wren, Bewick's wren, violet-green swallow, tree swallow, mountain bluebird, western bluebird, and purple martin) prefer early seral stages. Wildlife tree surveys (which includes the tallying of snags and live trees left for wildlife) during the past decade revealed an average of 1.05 wildlife trees per acre following timber harvest on BLM-managed lands.

Recent concerns have been expressed over species requiring large, dead-and-downed wood on the forest floor (Maser and Trappe 1984; Maser et al. 1988) as approximately 50 species find their primary habitat in dead-and-downed wood (Appendix 3-8). Although effects on species requiring this habitat are largely unknown, Noble, et al. (1990) recently found that black bears in the central Coast Range of Oregon prefer large rootwads as denning sites. Intensive forest management practices such as slash burning and thinning have reduced the amount of this habitat (Maser and Trappe 1984). When slash burning is done under spring-like conditions, the impact on dead-and-downed wood habitat is reduced.

Stream and associated riparian habitat (see Riparian Section) is of special concern as a large number (75 percent) of terrestrial birds and animals are dependent on these areas for at least a portion of their life functions. Beaver, mink, otter, and raccoon all depend on stream and riparian habitat for a major part of their life requirements. As a group, amphibians (salamanders, frogs) are highly dependent on this habitat, spending all or a major part of the year utilizing it. Waterfowl, shorebirds, great blue heron, kingfishers, and several species of bat are highly dependent on stream habitat for survival. The linear arrangement of riparian habitat and presence of water and cover enhance the suitability of these areas as corridors for local movement or long range migration. Approximately 18,332 acres along third order and larger streams are currently withdrawn from harvest in order to protect riparian values. The adequacy of buffers for protecting wildlife values within the riparian zone cannot be evaluated due to limited monitoring information.

Hardwoods provide primary habitat for about 126 species of wildlife in the planning area (Appendix 3-8). Because of their lower economic value in comparison to conifers, hardwood stands have been converted to conifer stands (78 acres, 1983-89) and hardwoods in plantations have been controlled to allow conifers to grow with less competition (2,400 acres, 1983-89). In contrast, hardwoods have often increased on disturbed and wet sites. The practices of conversion and conifer release have contributed toward the dominance of monotypic, even-aged stands of second-growth conifers in many portions of the planning area. Pacific slope flycatchers, black-headed grosbeaks, screech owls, and other hardwood-oriented species have likely been affected by the conversion of hardwoods.

Wooded swamps and wet meadows are vegetative communities influenced by high water table or standing water for all or a part of the year. Wooded swamps and bogs are often characterized by the presence of skunk cabbage. A number of unique species including the redlegged frog, northwest salamander, townsend water vole, and several bat species are dependent on these sites. Wet meadows consist of grasses, sedges and forbs, lack a woody overstory and maintain a high, stable water table throughout the year. These moist sites, though limited in size and distribution, can be important foraging sites and wallows for elk and black bear. Currently, there is no information available on the numbers or acres of swamps or meadow sites.

Cliffs, a high, steep or overhanging face of rock, and talus, an assemblage of loose rock, provide unique habitat for a number of species. Cliffs provide nesting sites or roosts for raptors, swallows, and bats. Thes and other unique ecosystems make up less than on percent of the district

The interstitial spaces within talus varies with the siz of rock, and along with moisture regimes, determine which species use a particular site. Amphibians us the more moist sites while bats, pika, marmots, bobcat and cougar use will be influenced by the size of th rock. The value of these sites for wildlife is influence by human disturbance; mining for rock aggregate, road construction and affecting the micro climate by altering surrounding vegetation.

The section below describes status, habitat and population conditions and trends, inventories, monitoring, and current management for high interest species.

Roosevelt Elk

The Roosevelt elk is highly valued in Oregon as a game species and for public viewing. There are an estimated 1,500 elk in the Roseburg District's Coast Range (1.5- 11.9 elk/sq mi) and 450 elk (1.8-2.6/sq mi) in the Cascade Mountains (ODFW estimates). The highest densities occur in the Tyee Area.

Roosevelt elk respond to the quantity and quality of forage and cover and their distribution in time and space (Witmer et al. 1985). Elk forage areas include grass-forb, shrub, and open sapling habitat of young seral stages, with less than 60 percent combined canopy closure.

Hiding, thermal, and optimal types of cover are refuge for elk. Hiding cover conceals 90 percent of a standing elk at 200 ft or less. All seral stages except the early age meet hiding cover criteria. Thermal cover requires forest stands at least 40 foot high with a canopy closure of at least 70 percent, which is characteristic of late, mature, and old-growth seral stages. Optimal cover requires stands with dominant trees averaging at least 21 inches DBH and 70 percent closure, characteristic of large sawtimber or old-growth forests (≥120 yrs old) with 70 percent closure. Optimal stands have four vegetation layers and a canopy which intercepts snow, but also has dispersed, small openings.

Winter range is an integral component in elk management. Elk tend to use south facing slopes and valley bottoms in the Coast Range during winter because of warmer temperatures, shallower snow and better forage availability. Elk use south facing slopes up to 4,500 ft elevation in the Cascades. Conversely, in summer, north facing slopes offer relief for elk during hot weather.

The interspersion of forage and cover areas in time and space, forage quality, and human disturbance from roads opened to motorized vehicles all appear to influence the use of an area by elk (Witmer et al. 1985). Timber harvest and associated activities have the potential for impacting populations by: 1) reduction of optimal cover, 2) creation of larger (50+ acres) openings which are used less by elk because of distance to escape cover, 3) harassment and poaching of elk by people from a road network, and 4) reduction in forage production and thermal cover.

The current quantity and quality of elk habitat appears to be stable to decreasing. Elk habitat has reached its optimum in most areas and may require improvement, or slowing of its decline. Within the next 50 years current areas used by elk will mature and produce less forage with lower quality which may result in significant declines of Roosevelt elk (Harris 1984). Even though elk have low dispersal rates into other areas, elk populations could increase under proper management.

Elk management in the district includes provisions for size limitations of clearcuts and spacing the harvest units across the landscape over time. The district has tested grass/legume seedings but has not successfully closed any roads to enhance elk habitat.

To date, limited monitoring of elk numbers yielded no useable data and no habitat monitoring has been conducted.

Elk habitat has been separated into 21 management areas on which management recommendations and assessment of impacts will be made. These areas along with their BLM and total acres are given in Table 3-19.

Black Bear

The black bear is common throughout forested regions of the Cascade and Coast Ranges, including the Roseburg District. Management of black bears in Oregon has reflected the polarity of popular opinion about bears. Management has varied between classification of bears as varmints to regulating them as trophy game. An average of 1,350 bears are killed by hunters state-wide each season with an additional 200 taken for damage control.

The state bear population has been estimated at 25,000 animals, with a density of 0.9 bears/sq mi in western Oregon (ODFW 1987a). ODFW obtains age data on bears from tooth samples submitted by hunters and damage control agents. Although there are inherent biases in the data - skewed towards larger males - the sampled age distribution falls within the acceptable limits used in the Idaho 1986 Black Bear Management Plan.

Black bears are omnivorous, depending mostly on succulent grasses, sedges and forbs in spring and summer, and berries, nuts, roots, and insects in summer and fall. Bears eat meat, fish, and small game, when available.

Habitat of black bears is determined by seasonal availability of food and hiding cover. Radioed bears in coastal habitats were located in relatively inaccessible heavy cover in old-growth or dense second-growth (Lindzey and Meslow 1977). Bears will occasionally use brushy clearcuts if cover is adequate.

The denning season averages 140 days, from late September through April (Wheeler, pers. commun.). Den sites are usually associated with large root masses of dead or live trees, stumps, conifers or hardwoods, snags, or large downed logs.

Black bears are highly adaptable, however, habitat loss due to gradual human encroachment can reduce populations. With habitat reduction, quality food and cover become more critical, and if bears are forced to leave protected enclaves to forage in less protected sites, mortality increases and number decline (Pelton 1982).

Bears and habitat are affected in several ways by timber management. Logging stimulates forage production for foods such as salmonberry, blackberry,

Table 3-19. Roosevelt Elk Management Areas

Elk Management Number	Area Name	BLM Acres	Total Acres	Percent BLM
CEEL 01	Gunter	15,717	24,611	64
CEEL 02	Smith River	10,338	20,315	51
CEEL 03	Tom Folley	12,220	23,641	52
CEEL 04	Green Ridge	7,465	14,815	50
CEEL 05	Yellow Butte	6,991	12,775	55
CEEL 06	Tyee	21,858	40,683	54
CEEL 07	Ben More	4,338	10,064	43
CEEL 08	Tyee Mtn.	7,530	16,255	46
CEEL 09	Camp Cr.	11,053	22,679	49
CEEL 10	Middle Mtn.	5,220	9,201	57
CEEL 11	Rock Cr.	25,782	42,926	60
CEEL 12	Little River	24,251	62,083	39
CEEL 13	White Rock	20,137	41,204	49
CEEL 14	Myrtle Cr.	33,454	90,284	37
CEEL 15	Deadman Mtn.	28,227	35,694	79
CEEL 16	Camas Valley	10,480	25,757	41
CEEL 17	W.F. Cow Cr.	26,540	58,516	45
CEEL 18	Twelve Mile	11,595	27,976	41
CEEL 19	Middle Cr.	19,819	44,385	45
CEEL 20	Hyde Ridge	13,302	24,475	54
CEEL 21	Green Butte	10,713	21,240	50
	Total:	**327,030**	**669,579**	

hazel, and huckleberry, and improves foods like grasses and forbs for up to 15 years. The increase in forage has a concommitant decrease in cover and logging roads allow easier access for hunters and poachers.

A black bear management plan was adopted by ODFW in 1987 (1987a). Strategies in the plan identified improving bear information and management: hunting, damage control, hunter pursuit seasons, and non-consumptive (viewing) use. The bear population is currently stable (Wheeler pers. commun. 1988) and the 1983 TMP ROD provided no specific management direction for the black bear. However, habitat improvement for other species like elk, which includes seedling and fertilization, road closure, maintenance of riparian areas, snag and down woody debris management, and long term species/successional diversity harvest strategies should benefit black bears.

Mountain Lion

The mountain lion, or cougar is of high public interest, primarily because its presence is viewed as an indicator of the wildness of an area. Cougars inhabit all areas of the district with the largest numbers occurring in the eastern half.

In 1989, ODFW estimated that 1,185 cougars inhabited western Oregon, about 55 percent of the statewide population. The species has been protected under game regulations since 1967, in response to declining numbers. Statewide populations have apparently increased since 1980 and the ODFW adopted a Cougar Plan in 1987 (ODFW 1987).

Cougars are found in close association with deer, their preferred prey (ODFW 1987), but also pursue elk, porcupine, lagomorphs, rodents, skunk, and birds. Cougars typically inhabit mountainous terrain with mature, open forest with boulder areas, rim ledges and ridges (Harcombe (1976). Some western Oregon cougars appeared undaunted by man's activities, but elsewhere studies indicated that human disturbance and logging adversely affected their habitat use (ODFW 1987).

No management activities have been conducted for cougar in the district and no monitoring has been carried out.

Columbian Black-Tailed Deer

In Oregon, the black-tail is valued as a game species, and for public wildlife viewing. They are the most versatile and widely-distributed large mammal species in the district. ODFW estimated spring densities of 26-44 and 16-26 deer/sq mi in the Cascade and Coast Mountain Ranges, respectively.

Black-tails prefer forests interspersed with natural meadows, grassy slopes, brush fields, and other early successional habitat or with man-created (timber harvest, wildfire) openings supporting low shrubs and forbs. Black-tails prefer winter range in stream and valley bottoms below 2,500 ft elevation, and south and SW facing slopes up to 4,500 ft. Thermal cover in mature and old-growth habitats in winter and summer are necessary for protection from extreme weather.

Home ranges of black-tailed deer can average less than a half-mile in diameter for females and young, and about three-fourths of a mile for males. Although the species is considered nonmigratory, they exhibit a definite elevational movement with snow conditions in the foothill and mid-elevation areas of the Cascades.

Timber harvest has a varied effect on black-tailed deer habitat. Five to eight years following clearcutting, food supplies increase and deer use of an area peaks. A gradual decline in deer use follows, as preferred browse plants grow out of reach of deer and are eventually shaded out by conifers. If a clearcut is large, much of it may not be used by deer because of the distance from forage to escape cover. Edgerton (1972) suggested that shelterwood harvest may result in a loss of cover and food supply for deer.

Deer habitat and numbers have remained stable due to a sustained level of timber harvest over the past decade. The 1983 TMP ROD had no management guidelines specifically designed to benefit black-tailed deer (USBLM 1983). No deer monitoring has been conducted by the district, but ODFW conducted deer population surveys as part of their annual big game censuses.

Wild Turkey

The Oregon Department of Fish and Wildlife initially released Rio Grand turkey in Douglas County in the early 1980s from stock captured in Texas and Kansas. By the mid 1980s turkeys were being relocated within the county. Adult diurnal use is concentrated in oak/savanah/woodland, recent clearcuts, and open meadows except during the late spring nesting period. During the nesting period hens made significant use of the mature conifer type. Turkeys roosted in five conifer species while rarely using hardwoods. Mean age, height and diameter (dbh) for all roost trees were 100 years, 33 meters, and 50cm respectively (Crawford, 1991).

Current distribution of turkeys covers the valley floors, oak-woodland hills and adjacent conifer forests.

Golden Eagle

Four nest sites used in the past by golden eagles have been located within the district. Three of the four sites are on BLM-managed land and all nests are located in trees. Information on golden eagles has been gathered incidental to other activities and no formal inventory of BLM-managed lands has been conducted to locate golden eagle nests.

Although the golden eagle is typically a bird of open country, it is found throughout the district with the interior valleys and surrounding oak/grasslands providing preferred hunting areas. Early grass/forb seral stages on conifer sites are also utilized by golden eagles to hunt for small mammals and carrion. Throughout the golden eagle's range, cliffs and large conifers provide preferred nesting sites.

Fish

Streams, rivers, and other water bodies in the planning area contain substantial habitat for numerous fish species, especially salmon and trout. These aquatic habitats meet at least one of the life history requirements (spawning, rearing, passage, etc.) for more than 25 species of native and introduced non-salmonid fishes and seven species of salmon and trout (see Appendix 3-9). The descriptions and analyses in this RMP are focused on priority fish species which are listed in Table 3-20.

Of the 837 miles of third order and larger streams within the planning area, 756 miles contain resident fish and 192 miles support anadromous salmon and trout (see Map 3-5).

An analysis of stream conditions by the district fish biologist revealed that 37 percent of streams on BLM-administered lands are in minimal condition, 29 percent are in fair condition, and 34 percent are in good to optimal condition.

On BLM-administered land, chinook salmon are found in 24 miles of stream, while coho salmon are found in 150 miles of stream, and steelhead trout in 174 miles of stream. Resident cutthroat trout are the most widely distributed sport fish and are found in 756 miles of steam on BLM-administered lands. Habitat conditions, by species, are shown in Table 3-20.

Table 3-20. Salmon and Trout Habitat Conditions[1]

Priority Species	Stream Miles	Condition of Habitat (miles)[2] Minimal	Fair	Good/Optimal
Chinook	24	6	7	11
Coho	150	54	47	49
Steelhead	174	58	52	64
Cutthroat	756	295	219	242

Sources: Stream inventories (40 miles) conducted by the district fish biologist and by ODFW; WODDB; and a related factors analysis (i.e., roads affecting riparian areas) completed by the district fish biologist.

Habitat is for streams on BLM-managed lands only.

See Appendix 3-7 for methodology of rating stream habitat quality

The potential of a stream to support fish production is directly related to the quantity and quality of aquatic habitat, which in turn is closely associated with the condition of the riparian area. Historic changes in riparian areas, including the removal of conifers in riparian and upslope areas, have considerably reduced the potential productivity of most streams. Fewer large trees resulted in less instream woody structure, water storage, channel complexity and stability, and suitable water temperatures. Improved riparian and stream channel protection on BLM-administered lands over the last ten years have allowed many stream segments to begin recovering. Full recovery is not expected for 200 years. As riparian and stream channels continue to improve, the productive capability of fish habitat will also improve.

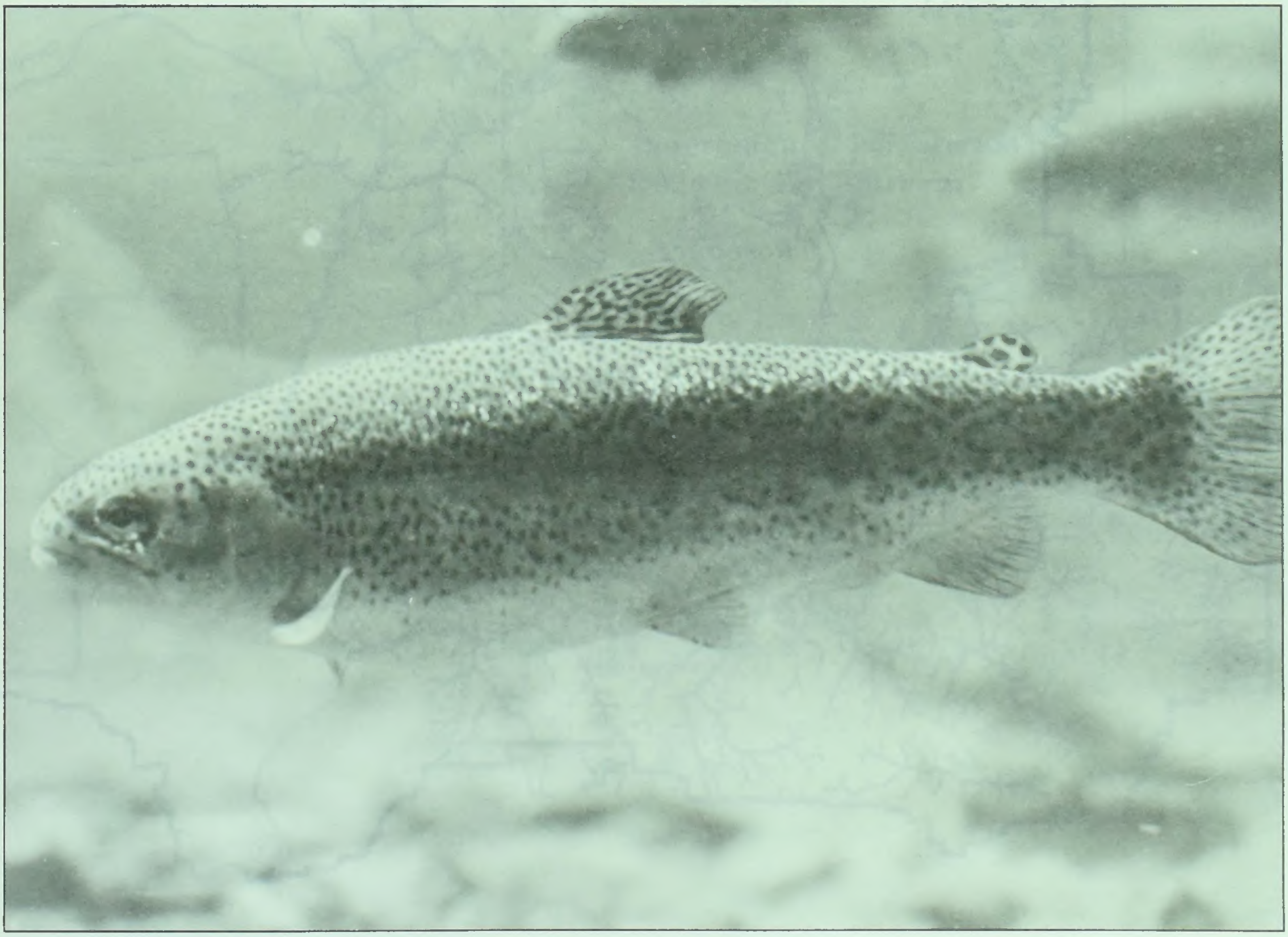
Special Status Species

Species which are limited in abundance and distribution and have identifiable threats to their existence are managed by the Bureau as special status species. Six separate categories are recognized:

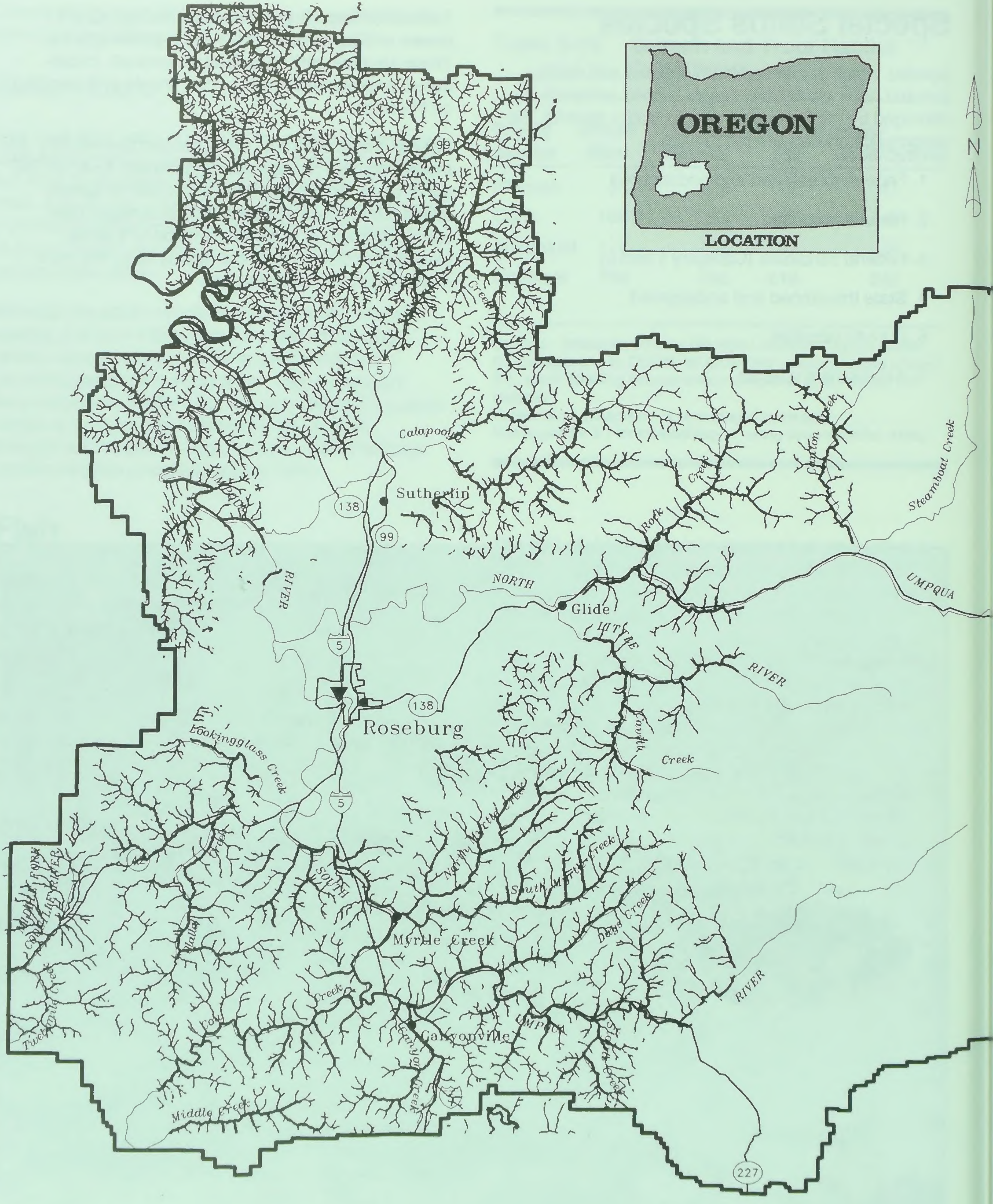
1. Federal threatened and endangered
2. Federal proposed
3. Federal candidate (Category 1 and 2)
4. State threatened and endangered
5. Bureau sensitive
6. Assessment species

Table 3-21 lists the special status plants that are known or suspected to occur in the planning area. There are presently no federal threatened, endangered, or proposed plant species known or suspected on the district.

Special status plant lists are amended as inventory and monitoring data provide new information. Over 60,000 acres of the district has been surveyed for special status plants since 1980 with twelve species have been documented at 34 locations on 374 acres. Geographic distributions are displayed on the Automated Resource Data System.



Rainbow Trout
Photo by Joe Ross


OREGON
LOCATION
N
99
5
Drain
Elk
Creek
5
Calapooya
Creek
Rock
Creek
Canton Creek
Steamboat Creek
138
Sutherlin
99
UMPQUA
RIVER
NORTH
UMPQUA
Glide
LITTLE
RIVER
5
138
Roseburg
Cavitt
Creek
Lookingglass Creek
5
42
North Myrtle Creek
South Myrtle Creek
Days Creek
Olalla
Creek
SOUTH
UMPQUA
MIDDLE FORK
COQUILLE RIVER
Myrtle Creek
Cow
Creek
Canyonville
UMPQUA
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U.S. Department of the Interior
Bureau of Land Management

ROSEBURG DISTRICT
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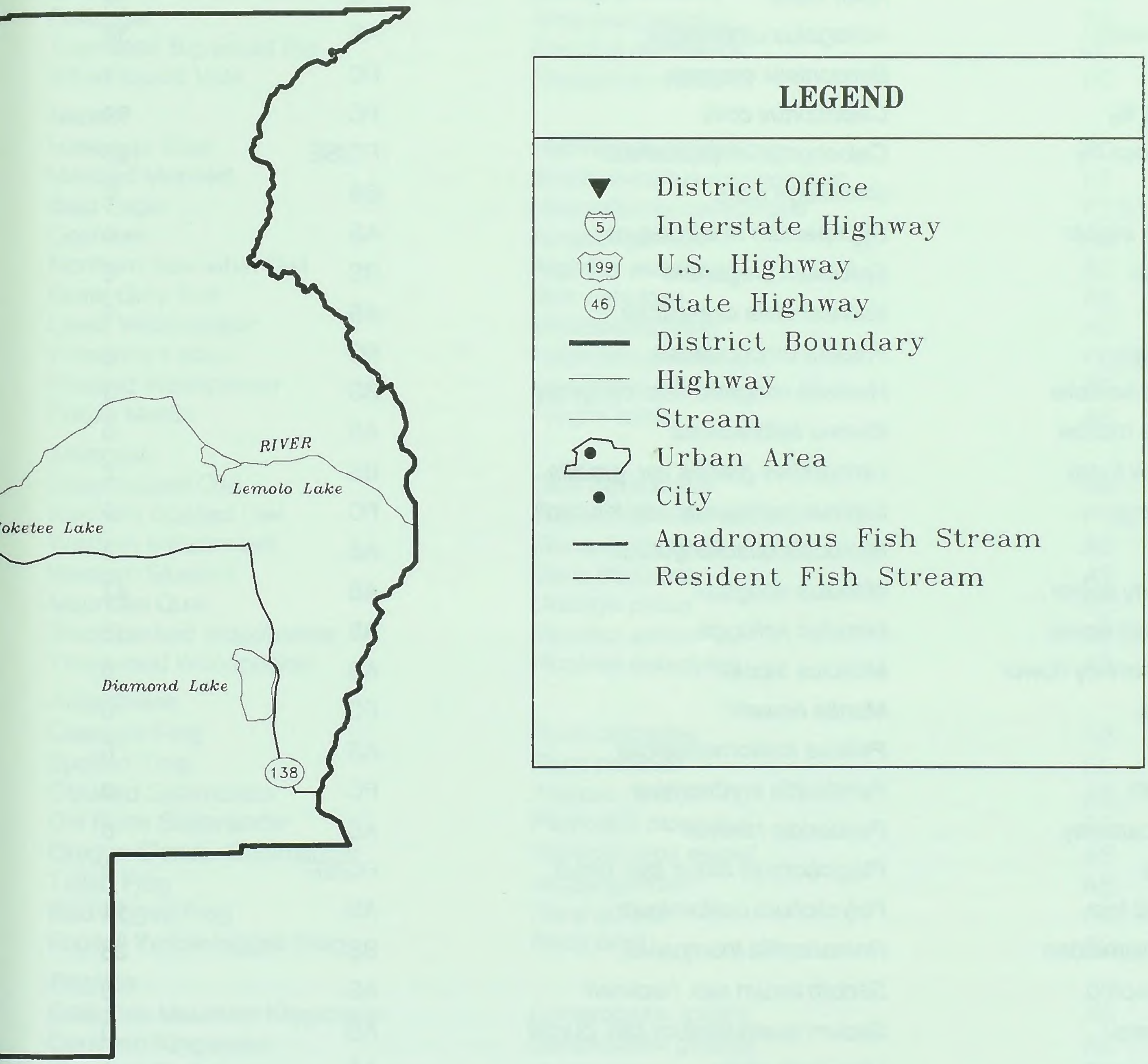


MAP 3-5: FISH-BEARING STREAMS

Table 3-21. Special Status Plant Species.

Common Name	Botanical Name	Status[1]	Acres
Bolander's onion	*Allium bolanderi*	AS	46
shrubby rock cress	*Arabis koehleri var. koehleri*	FC	0
grass fern	*Asplenium septentrionale*	AS	0
wayside aster	*Aster vialis*	FC	0
woodland milkvetch	*Astragalus umbraticus*	AS	30
bensoniella	*Bensoniella oregona*	FC	1
Cox's mariposa lily	*Calochortus coxii*	FC	69
Umpqua mariposa lily	*Calochortus umpquaensis*	FC/SE	123
tall bugbane	*Cimicifuga elata*	BS	0
clustered lady's slipper	*Cypripedium fasciculatum*	AS	0
Oregon fireweed	*Epilobium oreganum*	BS	0
gold poppy	*Eschscholzia caespitosa*	AS	0
Umpqua swertia	*Frasera umpquaensis*	FC	0
dense-flowered horkelia	*Horkelia congesta ssp. congesta*	BS	3
California globe mallow	*Iliamna latibracteata*	AS	0
slender meadow foam	*Limnanthes gracilis var. gracilis*	BS	2
Kincaid's lupine	*Lupinus sulphureus var. kincaidii*	FC	0
timwort	*Microcala quadrangularis*	AS	0
Douglas' monkey flower	*Mimulus douglasii*	AS	47
Kellogg's monkey flower	*Mimulus kelloggii*	AS	5
three colored monkey flower	*Mimulus tricolor*	AS	0
Howell's montia	*Montia howellii*	FC	0
coffee fern	*Pellaea andromedaefolia*	AS	0
red-root yampah	*Perideridia erythrorhiza*	FC	0
Howell's false caraway	*Perideridia howellii*	AS	0
rough allocarya	*Plagiobothrys hirtus ssp. hirtus*	FC/SE	0
California sword fern	*Polystichum californicum*	AS	11
Thompson's mistmaiden	*Romanzoffia thompsonii*	BS	28
Heckner's stonecrop	*Sedum laxum ssp. heckneri*	AS	0
Purdy's stonecrop	*Sedum spathulifolium ssp. purdyi*	AS	0
humped bladderwort	*Utricularia gibba*	AS	0
lesser bladderwort	*Utricularia minor*	AS	0
water-meal	*Wolffia columbiana*	AS	0
dotted water-meal	*Wolffia punctata*	AS	9

[1] FC=Federal Candidate
SE=State Endangered
BS=Bureau Sensitive
AS=Assessment Species

Table 3-22. Special Status Animal Species

Common Name	Scientific Name	Status[1]
Mammals		
Columbian White-tailed Deer	*Odocoileus virginianus leucurus*	FE/SE
Fisher	*Martes pennanti*	FC
Fringed Myotis	*Myotis thysanodes*	BS
Marten	*Martes americana*	AS
Pallid Bat	*Antrozous pallidus*	AS
Townsend Big-eared Bat	*Plecotus townsendii*	FC
White-footed Vole	*Phenacomys albipes*	FC
Birds		
Harlequin Duck	*Histrionicus histrionicus*	FC
Marbled Murrelet	*Brachyramphus marmoratum*	FP
Bald Eagle	*Haliaeetus leucocephalus*	FT/ST
Goshawk	*Accipiter gentilis*	AS
Northern Saw-whet Owl	*Aegolius acadicus*	AS
Great Grey Owl	*Strix nebulosa*	AS
Lewis Woodpecker	*Melanerpes lewis*	AS
Peregrine Falcon	*Falco peregrinus*	FE/SE
Pileated Woodpecker	*Dryocopus pileatus*	AS
Purple Martin	*Progne subis*	AS
Mammals		
Flammulated Owl	*Otus flammeolus*	AS
Northern Spotted Owl	*Strix occidentalis caurina*	FT/ST
Western Meadowlark	*Sturnella neglecta*	AS
Western Bluebird	*Sialia mexicana*	AS
Mountain Quail	*Oreortyx pictus*	FC
Black-backed Woodpecker	*Picoides acticus*	AS
Three-toed Woodpecker	*Picoides tridactylus*	AS
Amphibians		
Cascade Frog	*Rana cascadae*	AS
Spotted Frog	*Rana pretiose*	FC
Clouded Salamander	*Aneides ferreus*	AS
Del Norte Salamander	*Plethodon elongatus*	FC
Oregon Slender Salamander	*Batrachoseps wrighti*	AS
Tailed Frog	*Ascaphus truei*	AS
Red-legged Frog	*Rana aurora*	FC
Foothill Yellow-legged Frog	*Rana boyli*	FC
Reptiles		
California Mountain Kingsnake	*Lampropeltis zonata*	AS
Common Kingsnake	*Lampropeltis getulus*	AS
Sharptail Snake	*Contia tenuis*	AS
Western Pond Turtle	*Clemmys marmorata*	FC

[1] FE=Federal Endangered
FT=Federal Threatened
FP=Federal Proposed
FC=Federal Candidate
SE=State Endangered
ST=State Threatened
BS=Bureau Sensitive
AS=Assessment Species

Table 3-22 lists the special status animals that are known or suspected to occur in the planning area. There are currently seven mammals, 17 birds, eight amphibians, and four reptiles with special status. Two species have been listed as federally endangered two as federally threatened, and one federally proposed to be listed as threatened. The different habitats used by special status animals are provided in Appendix 3-8.

Brief descriptions on current knowledge of species occurrence, inventory efforts, habitat use, and conditions, and trends are provided below for federally listed, proposed, and candidate species.

Bald Eagle

The bald eagle is a threatened species in Oregon, under the Federal Endangered Species Act ([ESA] 1973, as amended [CFR, 1988]). The Oregon ESA also lists the eagle as a threatened species (ORS 1987). The recovery plan for the Pacific bald eagle (U. S. Fish and Wildlife Service [USFWS] 1986) is currently being implemented by cooperating agencies, including BLM.

Surveys of nesting eagles have been conducted annually in the district since 1979 by the Oregon Cooperative Wildlife Research Unit, in cooperation with Roseburg District biologists. Recent surveys revealed that six nesting pairs of eagles occur on district BLM-managed lands, although some alternate nests associated with territories have been on adjacent private land.

An annual average of six to eight eagles have been observed during the winter scattered along the three stems of the Umpqua River but there were no winter concentrations. Most of these birds were adults, and were assumed to be resident. There are no known communal night roosts in the Umpqua basin within the district.

In the Pacific Northwest, bald eagles nest in large old-growth trees, in habitats of primarily ponderosa pine, mixed conifer, Douglas-fir, Sitka spruce/western hemlock, and along large rivers, in black cottonwood (Anthony et al. 1982) and feed primarily on fish. Anthony and Isaacs (1989) found that most nests (84 percent) were within one mile of large bodies of water. The nest trees usually had an open view of the area and a clear flight path to the nest, with perch trees nearby. Nest trees were larger dominant or co-dominants in the stand and were usually components of old-growth or old-aged second growth forests - larger and older than trees produced under 80 - 100 year timber rotations (Anthony and Isaacs 1989).

Eagle communal night roosts described by Anthony et al. (1982) were characterized by mixed conifer and Douglas-fir habitats, where roost trees were larger than trees in the surrounding forest. More favorable microclimates occurred in communal roost areas than in adjacent forest stands, aiding in energy conservation by the eagles (Stalmaster 1981, Keister 1981).

Human disturbance has impacted both nesting and wintering habitat of bald eagles. Anthony and Isaacs (1989) found a negative relationship between proximity of eagles to clear cuts and main logging roads, and productivity. Other activities such as urban and recreational development, logging, mineral exploration and extraction have also impacted eagles (USFWS 1986). Shooting and pesticide contamination are the primary human-induced causes of eagle mortality. Pesticides that caused egg shell thinning which resulted in lower nest success and productivity (USFWS 1986) are no longer in use.

There has been no loss of known nesting or roosting habitat for bald eagles on district lands under the current land use plan. The number of known nesting pairs in the district has increased by four over the past decade and a statewide trend has seen a doubling of the number of occupied breeding sites since 1980 (Anthony and Isaacs 1989). This increase was due, in part, to an intensified survey effort, but suggests an upward trend toward the population recovery goal for the eagle.

The current management direction set by the 1983 TMP ROD (USBLM 1983a) provides for the management of the two nest sites known in 1983. Under this direction, any new sites found during the decade would be afforded equal management consideration.

Since 1983, five additional nest sites consisting of four new pairs and one historic pair were added and protected. Additionally, there are provisions for the management of potential habitat to meet future needs of the species to satisfy recovery plan goals.

There are 2,699 acres of existing and potential habitat designated for bald eagle management under the 1983 TMP ROD (USBLM 1983a). The Umpqua Corridor Habitat Management Plan provides specific direction for the management of 3,662 acres encompassing most of the 1983 allocation, plus additional acres added during the preparation of the plan (USBLM 1985).

Columbian White-Tailed Deer

The Roseburg population of Columbian white-tailed deer was listed as endangered in 1978 (Federal ESA [CFR 1988]). Prior to this time, the only known population was located along the lower Columbia River.

Surveys of white-tails were carried out by Smith (1981), and recently by ODFW. Smith (1981) estimated densities of white-tails of 23 deer/sq km (range = 18-35) in a 2,745 ha study area. Currently, there are an estimated 5,500 - 6,000 white-tails in Douglas County. Although the white-tail ranges includes district lands, no surveys have been conducted to determine numbers specifically on BLM-managed lands.

Columbian white-tails prefer riparian habitat, with 90 percent of all observations from one study documented within one km of the North Umpqua River (Smith 1981). Deer prefer grass-shrub, oak savannah, oak forest, conifer, riparian and woodland/grassland ecotone habitats (USFWS 1983). Deer use upland oak woodland/grassland areas in late winter and spring, and occupy low, riparian habitats in summer (USFWS 1983).

In the late 1970s, surveys of deer were carried out in upland conifer habitat, adjacent to the valley oak woodlands of the core deer use area. No deer use was documented (J. Lint pers. commun.). After more than a decade of population expansion, the area has not been resurveyed.

Residential and subdivision development, particularly along the North Umpqua River, is the primary threat to riparian habitats used by the white-tail. Brush clearing for pasture has reduced the available woodland/grassland ecotone, also important to the species (USFWS 1983). The role of district forested habitats on the life cycle of the species has not been determined. Therefore, the effect of timber harvest on the deer is unknown.

Malnutrition and vehicle collisions accounted for 50 percent of the white-tail mortality, with fence entanglement, predation and disease also important factors (Smith 1981). Almost half the road kills occurred in late summer, when deer moved to obtain water and better forage.

Columbian white-tailed deer habitat is currently considered stable and the population appears to be increasing. However, since the majority of vital habitat is in private ownership, it is not considered secure. Until large areas of habitat are secured through easement or purchase, the long-term outlook for the species remains uncertain.

Under the Record of Decision (BLM 1983a) for the Roseburg Timber Management Plan (BLM 1983b) lands were withdrawn from the commercial timber base to maintain habitat conditions suitable for use by deer. The withdrawn locations are: T26S, R4W, Sec 10 [6.7 ac]; T26S, R4W, Sec 17 [11.5 ac]; T27S, R4W, Sec 7 [4 ac].

Townsend's Western Big-Eared Bat

The Townsend's big-eared bat is a candidate species for listing on the federal threatened and endangered species list. The population of Townsend's big-eared bats wintering in western Oregon appears depleted, and is restricted to the Cascade and Calapooya Mountains (Perkins 1987). Perkins (1987) located only two nurseries, concluding it was unclear where the western Oregon population spent the summer. Cross (1976) was able to locate three nursery colonies in SW Oregon (Curry, Josephine, and Jackson Co.).

Perkins (1987) conducted inventories in the district and located hibernacula within the Scott Mt., Tenmile Mt., and Ben Irving Reservoir areas. A nursery was also documented in an unnamed cave.

The bat uses caves, cave-like structures such as abandoned mine tunnels, and buildings for hibernacula in winter, as well as roosts for summer nurseries. In temperate coniferous forests, the bat uses open sapling pole, shrub, and closed sapling pole stand habitats (Scharpf and Dobler 1985). Wet meadows, estuaries, and riparian areas are also important special habitats.

Human disturbance on roosting and hibernation sites used by Townsend's bats will likely result in abandonment. Forest harvest in one site adjacent to a hibernaculum may have caused its abandonment by the bats. Since the bat feeds upon insects and arthropods, pesticide and herbicide use in areas used by bats could adversely affect the local population by reducing prey base.

Cave habitats in Oregon have not been specifically managed as wildlife habitat and are subject to increasing human disturbance (Perkins 1987). This disturbance could result in a decline in available habitat for the bat if caves that they use are affected. No management of the species is currently being carried out in the district. Inventories are needed to determine the distribution and status of the species, and to determine if there is a need for habitat protection.

Northern Spotted Owl

The northern spotted owl was listed as a threatened species in June 1990, under the Federal Endangered Species Act (ESA) (1973 as amended). The owl is also listed as threatened under the State of Oregon Endangered Species Act. Owl surveys were initiated in the Roseburg District in 1976. Intensive monitoring has been conducted since 1983.

Between 1985 and 1990, due to an enhanced monitoring effort, there was a four-fold increase in the number of sites located on the district that were occupied by owl pairs; 35 sites in 1985 vs. 152 sites in 1990. In the same period, the number of sites which produced young ranged between eight in 1985 to 71 in 1990. The number of young located per productive site varied between 1.35 and 1.66 young in the same period.

As of 1990, an estimated 75 percent of the district has been inventoried for spotted owls. BLM has identified 207 owl locations on BLM-managed lands, and another 18 sites were scattered on private lands (See Map 3-6). Between 1986 and 1990, owl pairs were verified at least once at 177 separate locations. Single owls or unconfirmed pairs were found at over 70 other locations.

Owls have been studied using radio telemetry to determine habitat use and "home range" (Forsman et al. 1977, Postovit 1977, Garcia 1979, Forsman et al. 1984, Meslow et al. 1986). In nine study areas in Oregon, spotted owls used mixed conifer, Douglas- fir/ western hemlock, and mostly western hemlock/ Douglas-fir intermixed old-growth and mature forests, although habitat requirements and relationships are complex (see Thomas et al. 1990:143-170). In these study areas, the median amount of area used by each radioed pair varied between 615 and 2,375 acres (range = 563-3,984 acres), depending upon the location and habitat (Thomas et al. 1990:195). Within these forests, the "home range" of radioed owl pairs varied between 1,035 and 10,189 acres (Thomas et al. 1990:194). The median ranged between 1,411 and 6,390 acres depending upon the study area.

Forsman et al. (1985) described the structural characteristics of owl nesting, roosting, and foraging habitat - characterized by old-growth and mature forests. Optimal habitat included an uneven-aged multilayered canopy with overstory trees typically 230-600 yrs old. The age of the uneven-aged understory included young saplings to sawtimber (Franklin et al. 1981). Composite canopy closure was generally 70-80 percent and there was a high number of old trees with structural damage and decay, which could be important nesting sites for owls.

Since the early 1800s, timber harvest in Oregon and Washington, west of the crest of the Cascades old-growth forest has been reduced to approximately one-third (5 million acres) of the estimated original amount (Franklin and Spies 1986). Of the estimated 5.4 million acres of old-growth/mature forest remaining, about 63 percent is available for harvest (USFS 1986). In 1990, old-growth/mature forest comprised about 202,000 acres of district administered land.

The fragmentation of old-growth and mature habitat from timber harvest results in the degradation of individual owl habitat areas and movement corridors between habitats. Several factors then begin to work against the owl including lower dispersal/survival of young, greater risk of avian predation on owls (Dawson et al. 1986, Simberloff 1987), and increased colonization of barred owls, which may out compete spotted owls (Forsman and Booth 1986, Forsman and Meslow 1986, Allen et al. 1987, Hamer et al. 1987, Hamer and Samson 1987). The net effect has the potential to isolate subpopulations of owls, which can reduce genetic exchange and lower populations, thereby increasing the risk of further loss to the effects of an adverse random event (Dawson et al. 1986).

There are approximately 210,000 acres of suitable owl habitat (>80 yr old forest) in the Roseburg District.

Under the current management plan, 5,000-6,000 acres of this owl habitat will be sold annually. The trend for suitable habitat is downward and will continue until a low point is reached early in the 21st century. Owl population data are insufficient to identify a trend. However, the population is tracking the trend of habitat loss, because of the owls' dependence upon old-growth/mature forest habitats.

The current interim agreement with ODFW protects sufficient habitat to maintain 109 spotted owl habitat areas statewide, and to provide for approximately 90 pairs. Twenty seven of these areas are in the Roseburg District. To provide this protection in the district, approximately 55,500 acres of 80+ year-old forest habitat are included in the owl agreement areas, where only approved timber harvest will occur, pending the completion of the RMP. Total acreage of protected habitat at each site varies according to remaining habitat and land ownership.

BLM expanded interim management for spotted owls for FY 1991-92 by not planning any regular green timber sales in the habitat conservation areas (HCA) recommended by the interagency scientific committee. To the extent possible, planned sales outside the HCAs will be placed to reduce or eliminate impact on the habitat of forests with a mean dbh of ≥11 inches and canopy closure of 40 percent in order to manage dispersal habitat for owls.

If past practices on private land remain similar in the future, limited, if any, owl habitat would be provided. Monitoring of owls will continue annually. Owl habitat use and movement studies are ongoing in the district through a cooperative effort with the USFS, Pacific Northwest Research Station.

Marbled Murrelet

The marbled murrelet has been proposed for listing as a threatened species by the United States Fish and Wildlife Service (USF&WS). This species has not been documented in the Roseburg District, although only minimal effort has been expended to detect the presence of murrelets on the main Umpqua River and Smith River. The highest potential for nesting in the District would be within 50 miles of the coast and in old-growth stands (150 years+) containing trees averaging 32 inches dbh with large moss covered branches. (U.S. Fish & Wildlife Service, Proposed Threatened Status, June 1991.) Inland sighting up to 50 miles from the ocean have been associated with rivers and lakes.

Peregrine Falcon

The peregrine falcon is listed as a federal and state endangered species. (CFR 1988; ORS 1987). The Pacific Coast Recovery Plan for the American Peregrine Falcon has been prepared by the USF&WS and is currently in the implementation phase (USDI, FWS, 1982). There are no known active or historic eyries (nest site) in the district, although one site on National Forest lands is within ten miles of BLM-managed land. Although occasional winter sightings in the district are thought to be migrants, habitat inventories by ODFW in 1987 indicated potential nesting habitat exists at a number of locations. The sites with the highest value rating occurred on BLM-managed and private land along Callahan Ridge and Hill Creek site on BLM managed land in T 28 S., R. 2 W., Section 5.

Peregrine falcon prefer tall cliffs with ledges and potholes that overlook large expanses and are near water (USDI, FWS, 1982). Although loss of habitat has influenced the decline of this species, it is thought Dichloro-Diphenye-Tricholorethene (DDT) and related chemicals were primarily responsible for population declines. In addition to maintaining the integrity of nesting cliffs, a number of other techniques including captive breeding, nest site manipulation, and hacking (release of captive raised young) are being utilized in the recovery of this species.

White-Footed Vole

The white-footed vole is a candidate species for possible listing as a threatened or endangered species. The white-footed vole inhabits dense forests of northwestern California and western Oregon and is considered very rare in northwestern Oregon. This species is the rarest member of the vole family in North America, although Maser et al. (1981) believes it is more common than previously thought.

Most specimens of the white-footed vole have been taken along the Oregon Coast, where the species is generally distributed. According to Maser (1981) the range of this species would encompass the northwest quadrant of the Roseburg District, north of Route 138 and west of Interstate 5. Within this area, riparian habitats are preferred, particularly along small streams dominated by alder and salmonberry. Inventories for this species within the district is limited to small mammal trapping conducted by the Pacific Northwest research stations old-growth study team. White-footed voles were trapped at very few of the study team's trap sites.

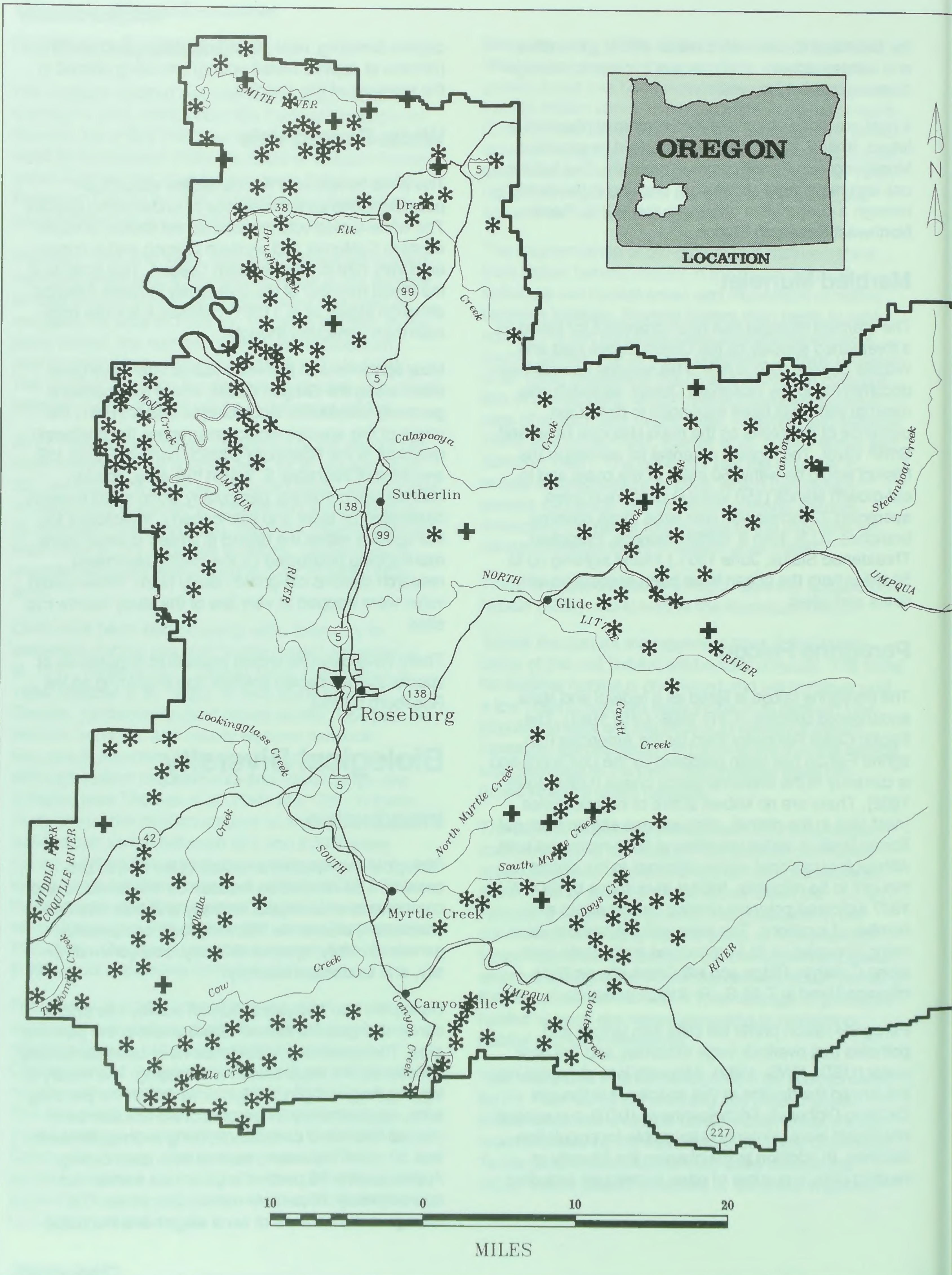
There have been no known impacts to populations of special status species animals due to grazing on the Roseburg District.

Biological Diversity

Introduction

Biological diversity is the variety of life and its processes. This discussion focuses on the concepts and components of biological diversity and their interrelationships. It covers the following focal components: genetic diversity, species diversity, ecosystem diversity, and landscape diversity.

During the last 150 years, human activity has significantly changed the natural environment of the planning area. The remaining forest lands have been particularly affected by fire suppression and logging. The history of logging, beginning in 1918, has varied. In the planning area, approximately 27 percent of the suitable commercial forestland consists of young even-aged stands less 30 years old which resulted from clear cutting. Approximately 56 percent is partial cut stands and approximately 17 percent remain unentered. The change in the balance of seral stages and the reduc-


OREGON
LOCATION
N
SMITH RIVER
Drain
Elk
Brush Creek
Creek
Wolf Creek
UMPQUA
RIVER
Calapooya
Sutherlin
NORTH
UMPQUA
Glide
LITTLE
RIVER
Canton Creek
Steamboat Creek
Rock Creek
Creek
Cavitt Creek
Roseburg
Lookingglass Creek
Creek
SOUTH
North Myrtle Creek
South Myrtle Creek
Days Creek
MIDDLE FORK COQUILLE RIVER
Olalla
Myrtle Creek
Cow Creek
Canyonville
UMPQUA
RIVER
Canyon Creek
Stouts Creek
Middle Creek
Twomile Creek
5
38
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MILES

U.S. Department of the Interior
Bureau of Land Management

ROSEBURG DISTRICT
1992 RMP/EIS

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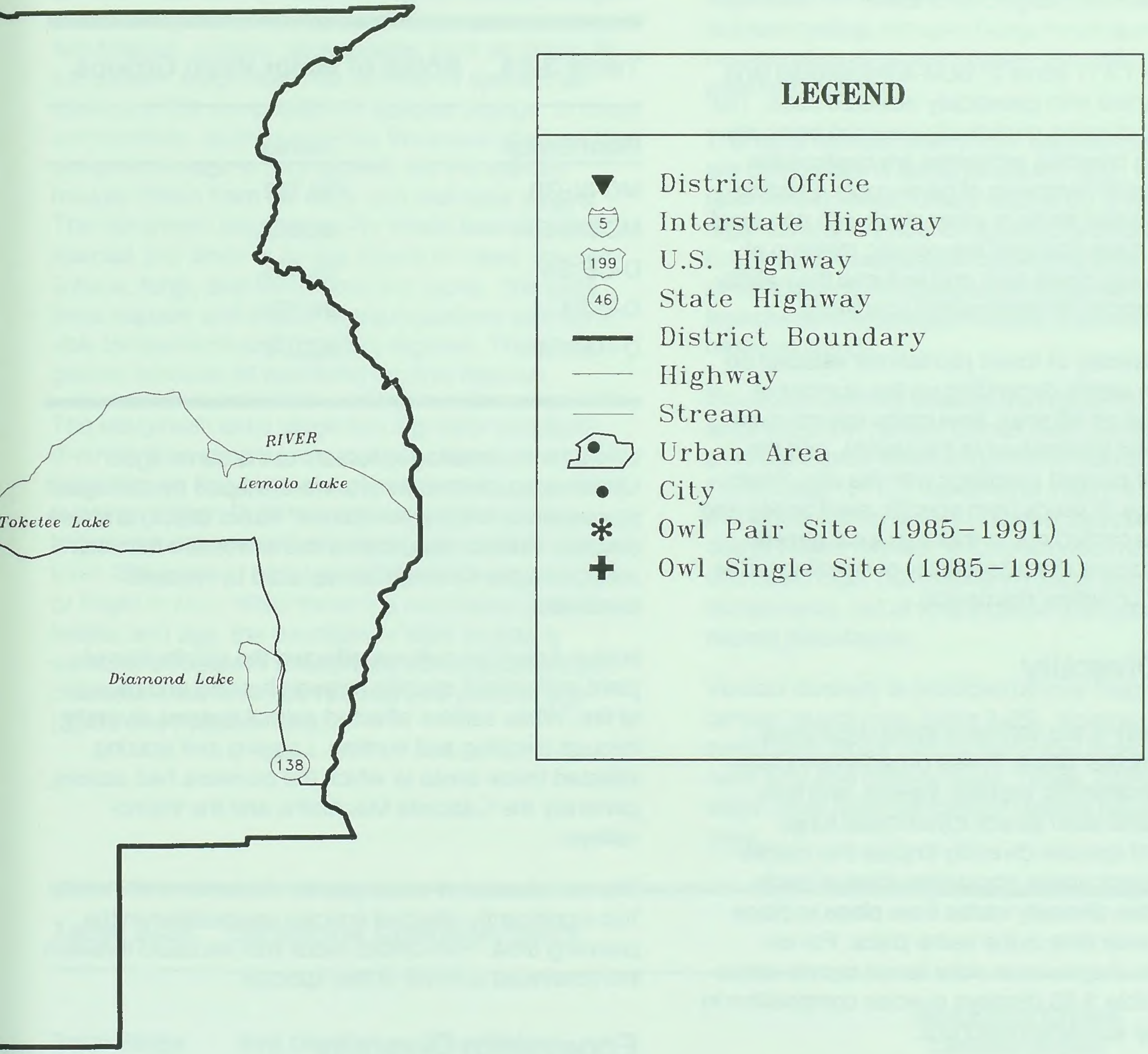


MAP 3-6: SPOTTED OWL SITES

tion in old-growth forest ecosystems has been dramatic. Therefore, the discussion of biological diversity emphasizes forestland and, specifically, old-growth.

Genetic Diversity

Genetic diversity is the diversity within and among populations of a species. The number of genes within a specific species can range from 1,000 in bacteria to 10,000 in fungi, to 400,000+ in flowering plants (Wilson 1988).

Approximately 1,811 acres of BLM-administered land have been planted with genetically selected trees. The consequences of using genetically selected trees are uncertain. Tree breeding programs are designed to prevent excessive narrowing of gene pools. Planting genetically selected stock or other stock with non-local parents could have changed the genetic makeup of populations in any given area and reduced their ability to adapt to changing environmental conditions.

The genetic diversity of forest plantations established in recent years varies depending on the number of seed trees used as sources, how many natural seedlings established themselves in the stands, and the compatibility of planted seedlings with the site. Selection and storage of seeds from specific seed zones and elevations was carried out to maintain local genetic diversity and assure site adaptability of seedlings. See Appendix 2-4 for further discussion.

Species Diversity

Species diversity is the variety of living organisms found in a particular place. These organisms include plants, birds, mammals, reptiles, insects, and less visible organisms such as soil mycorrhizal fungi. Maintenance of species diversity implies the maintenance of minimum viable population sizes of each species. Species diversity varies from place to place and changes over time in the same place. For example, the mix of species in older forest stands varies by location. Table 3-23 displays species composition in such stands by sustained yield unit.

Table 3-23. Species Composition in Mature and Old-Growth Stands

Species Composition by Basal Area (Percent)				
Douglas-fir	Pine	Wh.Fir	Other Conifers	Hardwoods
68.4%	2.3%	2.9%	16.0%	10.5%

Plant species diversity is partly dependent on the variety of plant associations described in the vegetation section. The acres of the various major forest plant groupings occurring on BLM-administered lands in the district are shown in Table 3-24. Their distribution is shown on the Major Plant Group map in the accompanying packet. Plant species diversity within natural Douglas-fir stands and those under even-aged management varies by stand age. The coniferous species composition of managed forests also differs to some extent from unmanaged forests of the same ages. Unmanaged, natural forests were shaped by ecological processes of wildfire, windthrow, insect attack, and tree disease. Without disturbance in the western hemlock zone, Douglas-fir would be replaced by western hemlock.

Table 3-24. Acres of Major Plant Groups

Plant Group	Acres
MC-IV-GR	159,782
MC-MB-SA	45,952
D-CE-SA	52,803
D-B-SA	99,181
D-RA-VM	62,077

Native American cultures affected the distribution of plant and animal species through hunting and the use of fire. White settlers affected animal species diversity through trapping and hunting. Logging and grazing affected those areas to which the pioneers had access, generally the Cascade Mountains and the interior valleys.

The introduction of exotic plants, diseases, and insects has significantly affected species composition in the planning area. Port-Orford cedar root rot could threaten the continued survival of this species.

Ecosystem Diversity

Ecosystem diversity is the biological communities and ecological processes (both kind and number) that occur in different physical settings. Old-growth forests, riparian areas, or upland meadows are examples of ecosystems. Ecosystems can be subdivided into local communities.

Classification of communities into plant associations is incomplete on BLM-administered land, but for purposes of the RMP/EIS, plant communities with similar characteristics have been aggregated into major plant groupings, discussed previously.

Special habitats provide another component of ecosystem diversity. These include serpentine barrens, bogs, meadows, rock cliffs, and talus slopes (see Vegetation, Special Areas, and Water sections).

Plant and animal species in natural ecosystems vary by seral stage (see Vegetation section). Early seral communities usually have the largest number of higher (vertebrate) animal species and high representations of sun-tolerant, pioneer plant species such as grass. As succession progresses, the number of species declines and the composition of species change. In forest communities, species diversity increases again as the old-growth stage is approached, but the species mixture differs from the early and mid-seral stages. The old-growth stage supports shade-tolerant plant species and tends to be the richest in insect species, lichens, fungi, and micro-flora and fauna. The large trees support and shelter these organisms with favorable temperature and moisture regimes. There are greater amounts of non-living organic material.

The old-growth seral stage has a greater structural diversity than even-aged, younger, closed-canopy seral stages. For purposes of interpretation of existing forest inventory, BLM has defined old-growth as forestland which is at least 10 percent stocked with trees 200 years or older in stands which are 10 acres or larger in size. While there is a correlation between habitat and age, the condition of older forests is variable. Douglas-fir forests may develop old-growth characteristics between 150 and 250 years of age (Spies and Franklin 1988).

A preliminary ecological definition of old-growth was developed by U.S. Forest Service (USFS) researchers (Old-Growth Definition Task Group 1986). Definitions for individual series currently are being prepared. BLM has no specific mature/old-growth inventory showing what stands meet the USFS old-growth definition. However, an inventory has been initiated.

Structure in an ecosystem or community is the relationship of physical size, height and vertical stratification of vegetation. It relates to ecological processes such as nutrient cycling, nitrogen fixing, forest succession, incorporation of organic matter into soils, and predator-prey relationships.

The most obvious differences between seral stages are differences in stand structure, (e.g., trees, snags, fallen trees), which create habitat for a variety of organisms and influence nutrient cycling and other functional processes. Structures retained from later seral stages to the early seral stage serve as biological legacies. In unmanaged forests, such retention varies between stands.

Structural diversity is lower during the mid and late seral stages of natural stands than during other stages of successional development (Franklin and Dyrness 1973; Long 1977; Franklin et al 1981). Younger managed stands have the lowest structural diversity due to timber harvest which removed most dead trees and down logs. Harvesting in recent decades left these components, but at levels below that occurring after natural disturbance.

Vertical diversity is provided by tree heights and canopy layers (see Table 3-25). Younger stands, particularly those without biological legacies, often have only one canopy layer. Those younger stands which have reached canopy closure have little understory.

Table 3-25. Structural Characteristics

Seral Stage (or Age Class)	Avg Dia (inches)	Avg TPA[1] Over 30 Inch	Percent of Crown Closure (acres) 10-40	40-70	70-100
Late	15.9	1.5	2,100	16,500	18,700
Mature	22.2	7.1	8,900	43,100	31,200
Old-Growth	25.2	23.4	10,300	82,200	18,100

[1] Trees per acre

The size and frequency of canopy gaps and the degree of canopy closure influence species composition, successional dynamics, nutrient cycling, and wildlife habitat. Canopy gap formation becomes significant in the mature seral stage and stands begin to develop multiple canopies as reproduction begins in the gaps. Disturbance frequency and severity is the primary determinant of gap formations in an ecotype (Spies, Franklin and Klopsch 1990).

The death and fall of canopy trees determines the structure and dynamics of forest ecosystems. Snags provide habitat for cavity users (see Wildlife section). Dead and down woody material provides habitat for many species including decomposers that are considered critical to the overall health of the forest. Average dead and down material is summarized in Table 3-26.

Of all the functional mechanisms responsible for shaping forest communities, disturbance events are particularly significant. These events reset plant succession in entire stands or in patches and prevent succession from continuing to a true climax on most sites. They include wildfire, windthrow, insect attack, and tree disease. Fires have been the predominant events and have played a major role in plant succession. The prehistoric cycle of stand-replacing fires which cause high or complete mortality in an overstory stand of trees, probably averaged 150 years in the southern portions of the planning area and 250 years in the northern portions of the planning area. Stand-replacing fires, such as those in the southern portions of the planning area, in the middle of the 19th century, burned as much as 200,000 acres each.

Fire suppression, starting in the 1920s, has progressively reduced the size of wildfires. Fire exclusion has led to development of dense underbrush and increased occurrence of shade-tolerant climax species (Stewart 1986). It has also resulted in the encroachment of trees into grassy balds and meadows (Vale 1981). In the last ten years stand-replacing wildfires have burned 13,841 acres of BLM-administered land in the Roseburg District.

Table 3-26. Dead and Down Material (conifer stands)

Seral Stage (or Age Class)	Per Acre Down Logs (tons)
Early-Mid	N/A
Late	15.5
Mature	42.2
Old-Growth	25.3

Landscape Diversity

Landscape diversity is the geography of the size, shape, and connectedness of different ecosystems across a large area. Landscape diversity may be described in terms of the arrangements of stands within a watershed or larger area, or the arrangement of patches within a stand. For example, a landscape interspersed with grasslands, shrublands, meadows, ponds, streams, wetlands, and forests has greater biological diversity than one with a broad expanse of grassland.

Older forest ecosystems in a continuous network of habitat originally occupied a significant, but unknown, portion of southwestern Oregon forestland. It is estimated that old-growth forests occupied at least 50 percent of the original landscape, perhaps less in the more fire prone interior valley and foothills forests (Andrews and Cowlin 1940). The amount of old-growth that originally occupied the commercial forest land in the Douglas-fir region has been estimated to have been 60 to 70 percent (Franklin and Spies 1984). The location of existing mature and old-growth stands are shown on the Major Plant Group Map in the accompanying map packet.

Harvesting has reduced the proportion of the forest which exists as later seral stages and fragmented older stands into a series of habitat islands separated by younger or partial cut forests. The remaining natural forest on BLM-administered lands is further fragmented because of the checkerboard pattern of BLM-administered lands. Clearcuts on BLM-administered lands tend to be spread across the landscape and average 10 to 40 acres in size. Partial cut unit size varies but is generally the same average size as clearcuts. Larger areas have on occasion had light partial cuts to accomplish mortality salvage.

The size of old-growth patches and the seral stage of adjacent stands have been shown to affect the quality of habitat which exists within old-growth patches. All smaller patches and those portions of old-growth stands close to the edge of an early seral block are subject to a variety of external influences that substantially reduce their effectiveness as old-growth habitat. These influences include wind (which influences temperature) and predation from species inhabiting adjacent lands. Thus, effective interior old-growth habitat is substantially less than actual old-growth acres (Harris 1984). Most studies identifying the extent of such influences have occurred outside the Pacific Northwest. Harris concludes that edge effects extend approximately 600 feet into old-growth stands from adjacent clear cuts due to changes in environmental parameters such as light, temperature, and relative humidity; and that old-growth must exceed 1,200 feet across and 26 acres in size before interior old-growth habitat begins to be retained with all old-growth characteristics intact. Chen, Franklin, and Spies (1990) indicate that the effect of edge on relative humidity extends over 240 meters (787 feet) into old-growth stands. Other analysts have concluded that effective habitat starts about 400 feet from adjacent clearcuts. The Wilderness Society and the U.S. Forest Service have used that distance in some recent analyses.

The extent of fragmentation of older forest habitat on BLM-administered lands is shown in Table 3-27. Interior habitat shown in that table is habitat at least 400 feet from adjacent lands with forest stands younger than 70 years or private lands. Even many of the largest blocks of old-growth contain little interior habitat due to the Swiss cheese effect created by past clearcut patches in their interior.

These remaining old forest blocks are shown on the Major Plant Group Map in the accompanying map packet. Harris (1984) suggests that this habitat fragmentation has substantially reduced the population of forest interior animal species such as fishers, wolverines and lynx, compared to that existing prehistorically, but Lehmkuhl and Ruggiero (1990) found that correlations between fragmentation and the richness and abundance of animal species in Pacific Northwest forest were weak.

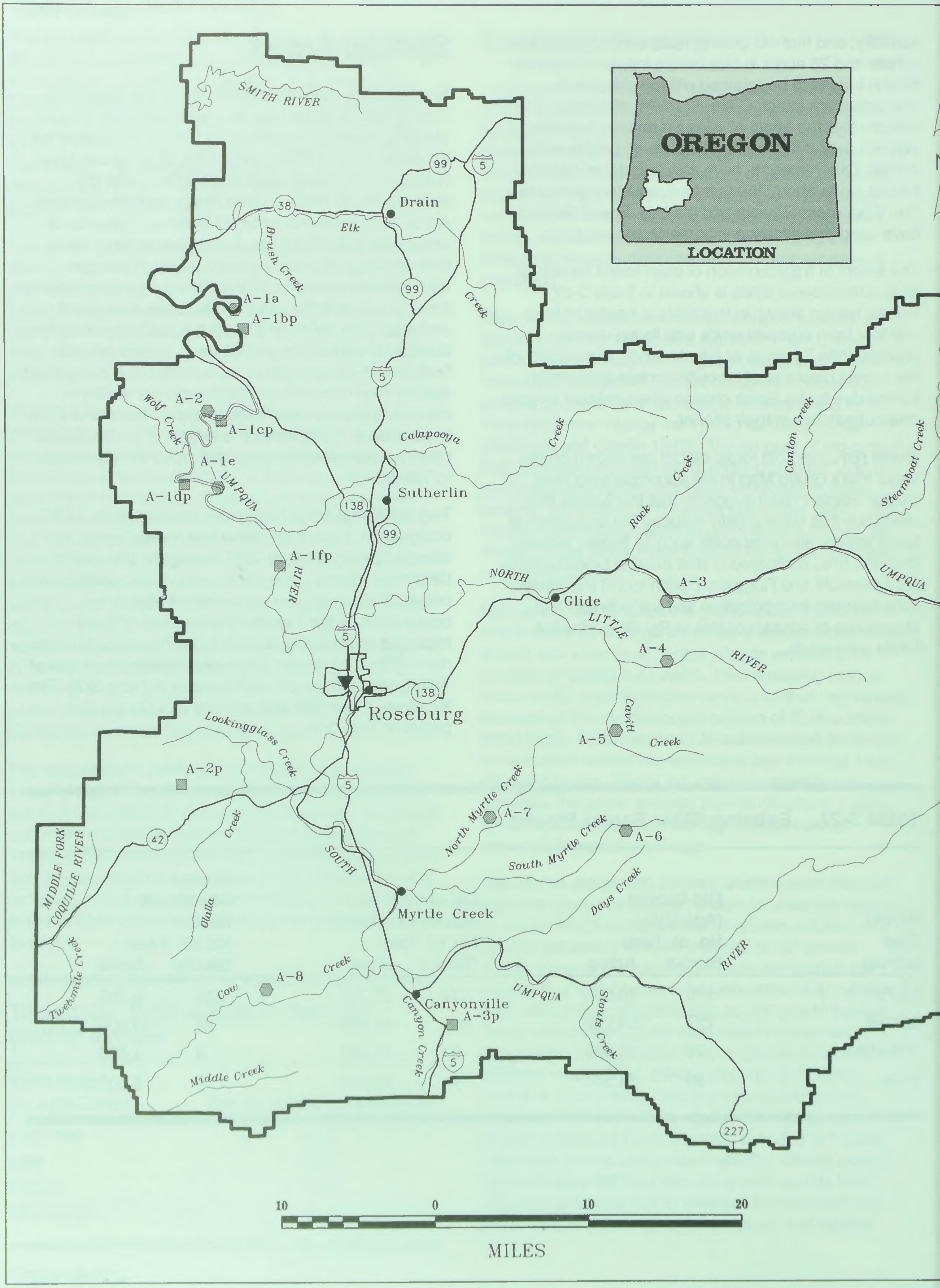
Special Areas

Special areas currently designated on the Roseburg District include areas of critical environmental concern (ACEC), research natural areas (RNA), environmental education areas (EEA), and outstanding natural areas (ONA). ACECs have been designated under the authority of the Federal Land Policy and Management Act of 1976 to protect natural resources, systems, or processes that have been determined to have more than local significance and are in need of special management attention. RNAs have been designated to protect natural features for the purpose of research and education, EEAs to protect natural features for the purpose of education, and ONAs to protect natural features for the purpose of recreation. Each designated special area received an interdisciplinary review to consider potential modifications and to determine if the areas met ACEC criteria. The results of the interdisciplinary review of existing special areas are presented in Table 3-28.

Two additional areas have been nominated for ACEC designation. Each nomination was evaluated by an interdisciplinary team of BLM managers and staff to determine whether their values met ACEC qualification criteria. Both areas were determined eligible for designation by the interdisciplinary team and are regarded as potential ACECs in the Resource Management Plan. The results of the interdisciplinary review of ACEC nominations are summarized in Table 3-29. The locations of potential and existing ACECs are displayed in Map 3-7.

Table 3-27. Existing Older Forest Blocks

Block Size (acres)	Old-Growth (Age 200+) No. of Blocks	Total Acres	Old-Growth and Mature Combined No. of Blocks	Total Acres	Interior Old-Growth Habitat No. of Blocks	Total Acres
20-79	510	20,500	674	27,700	224	9,200
80-299	227	34,800	339	54,500	72	10,900
300-599	72	29,300	99	40,900	8	3,500
600+	20	34,500	41	65,500	4	5,300


OREGON
LOCATION
SMITH RIVER
Drain
Elk
Brush Creek
Creek
A-1a
A-1bp
A-2
Wolf Creek
A-1cp
Calapooya
A-1e
UMPQUA
A-1dp
Sutherlin
A-1fp
RIVER
NORTH
Glide
A-3
UMPQUA
LITTLE
A-4
RIVER
Creek
Rock Creek
Canton Creek
Steamboat Creek
Roseburg
Lookingglass Creek
Cavitt Creek
A-5
A-2p
North Myrtle Creek
A-7
South Myrtle Creek
A-6
MIDDLE FORK COQUILLE RIVER
Creek
SOUTH
Olalla
Days Creek
Myrtle Creek
Twelvemile Creek
RIVER
A-8
Cow Creek
Canyonville
A-3p
UMPQUA
Canyon Creek
Stouts Creek
Middle Creek
99
5
38
99
5
138
99
5
138
5
42
5
227
10
0
10
20
MILES

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Bureau of Land Management

ROSEBURG DISTRICT
1992 RMP/EIS

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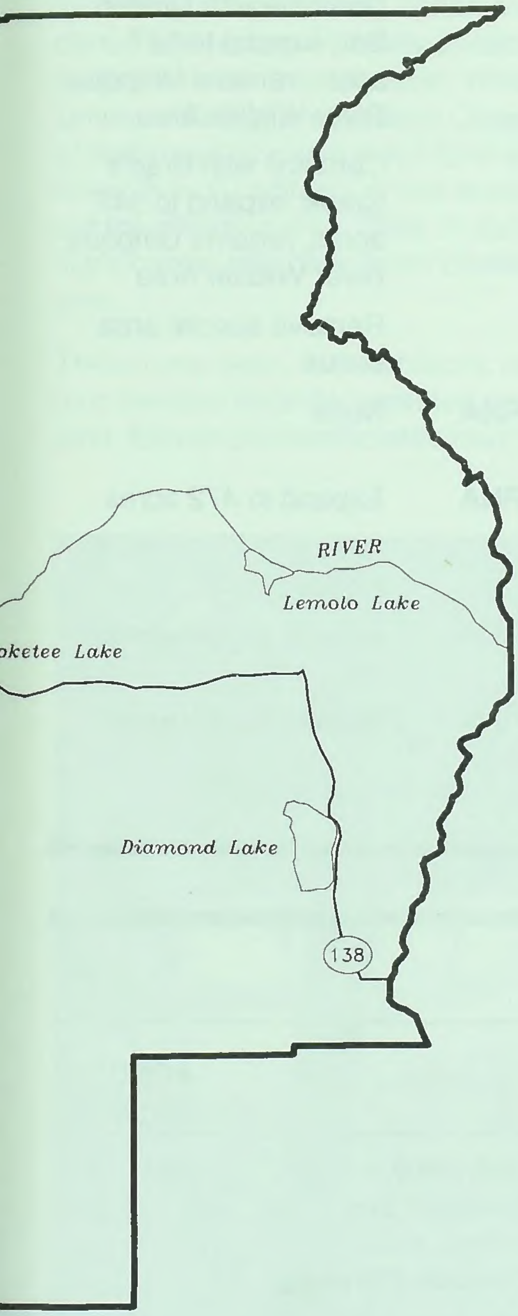


LEGEND

▼	District Office
5	Interstate Highway
199	U.S. Highway
46	State Highway
━	District Boundary
—	Highway
—	Stream
●	Urban Area
•	City
⬢	Existing Special Area
■	Proposed Special Area

Special Area Key

A-1a-f = Umpqua River Wildlife Area
A-1a = Brad's Creek Tract
A-1bp = Martin Creek Tract
A-1cp = Lost Creek Tract
A-1dp = Cougar Creek Tract
A-1e = Golden Bar Tract
A-1fp = Woodruff Mountain Tract

A-2 = Myrtle Island
A-3 = North Umpqua
A-4 = Little River Rock Arch
A-5 = Red Pond
A-6 = Tater Hill
A-7 = North Myrtle Creek
A-8 = Beatty Creek

A-2p = Bushell Irwin Rocks
A-3p = Bear Gulch

MAP 3-7: SPECIAL AREAS

Table 3-28. Existing Special Areas.

Special Area	Size (Acres)	Primary Value	Designation Current	Designation Proposed	Potential Modification
Beatty Creek	173	Jeffrey pine communities on serpentine soils at low elevations	RNA	ACEC/RNA	Expand to 331 acres
Brad's Creek	127	Bald eagle & osprey nesting habitat, class II scenic	ACEC	ACEC	Combine with Golden Bar, expand to 947 acres, rename Umpqua River Wildlife Area
Golden Bar	93	Bald eagle & osprey nesting habitat, class II scenic, cultural resources	ACEC	ACEC	Combine with Brad's Creek, expand to 947 acres, rename Umpqua River Wildlife Area
Little River	15	Geologic formations	ONA	None	Remove special area status
Myrtle Island	30	Riparian woodland in the Umpqua Valley	RNA	ACEC/RNA	None
North Myrtle Creek	240	Mixed conifer forest in the Umpqua Valley	RNA	ACEC/RNA	Expand to 472 acres
North Umpqua	1620	High use recreation area	ACEC	ACEC	None
Red Pond	85	Low elevation permanent ponds	EEA	ACEC/RNA	Expand to 134 acres
Tater Hill	170	Active slide associated with successional plant communities	ACEC/RNA	ACEC/RNA	Expand to 280 acres

Table 3-29. Nominated ACECs

Special Area	Potential Designation	Size (Acres)	Description	ACEC Eligibility
Bear Gulch	ACEC/RNA	330	Douglas-fir-canyon live oak forest and southwestern live oak forest in the west slope of the Oregon Cascade Province	Yes
Bushnell Irwin Rocks	ACEC/RNA	958	Oak-madrone -conifer woodland and first to third order stream system in the Umpqua Valley	Yes

Cultural and Paleontological Resources

The planning area encompasses lands that fall within the southwestern Oregon Interior Valleys cultural area. Human occupation of the planning area may date back continuously for 11,000 years. A variety of occupation sites represent a wide range of human activities over this time span. These sites range from sedentary/semi-sedentary village sites to ephemeral seasonal residence and resource/activity specific sites. A number of aboriginal trails link the coast, Willamette Valley, Umpqua Valley, and eastern Oregon areas. Evidence of dispersed land use in the form of isolated finds (i.e., fewer than 10 artifacts at one location) occur throughout the planning area. Sites of aboriginal religious significance also have been identified in the planning area.

There have been 108 prehistoric sites and 32 prehistoric isolated finds documented on BLM-administered land. Eleven prehistoric sites have been determined eligible for listing on the National Register of Historic Places, and one, the Susan Creek Indian Mounds, is listed on the Register.

Historic records for the planning area date to the 1820s with the onset of the fur trade. Settlement was well underway in the 1840s, and confinement of Indians to local reservations was completed in 1857. Historic development of planning area lands included homesteading, mining, grazing, logging, recreation, fire protection, and Federal government actions and activities. Sites representing these historic activities include roads, trails, structures, engineering facilities, early logging sites and other features and materials.

There are 11 inventoried historic sites located on BLM-administered land. One, the China Ditch, has recently been listed on the National Register of Historic Places.

Three sites with religious significance for Native Americans are known to be located within the planning area. These are the vision quest site at Susan Creek and the sites of two reinterments.

Red Pond ACEC
Photo by Russ Holmes

Paleontological sites in the planning area are generally associated with Eocene marine sedimentary formations. These formations are known to produce fossil botanical and marine invertebrate specimens. These formations also have the potential to produce vertebrate fossils, but none are known to have been found within the district. Paleobotanical specimens in the Miocene Little Butte volcanic series are also known within the planning area. An isolated Pleistocene vertebrate specimen has been recovered from the Days Creek area.

Visual Resources

Visual resources are the land, water, vegetation, structures, and other natural features or cultural modifications that make up the scenery of BLM-administered lands. So that visual resource (scenic) values can be considered when planning management activities, BLM-administered lands have been inventoried, evaluated and assigned inventory classes according to their relative worth from a visual resource management (VRM) point of view. There are four visual resource inventory classes established by BLM manual. Objectives for each class are used to identify management prescriptions that would maintain, enhance or preserve scenic values. These objectives and management prescriptions are described in Chapter 2.

Of all BLM-administered land inventoried in the district, less than one percent is Class I, 18 percent is Class II, 6 percent is Class III, and 76 percent is Class IV. Acreages of each inventory class are listed in Table 2-1 (alternative D column), and the classes are delineated on Map 3-8. Much of the Roseburg District has a fragmented land ownership pattern with non-BLM lands dominating the landscape.

The only Class I area on the district is the Myrtle Island ACEC. Class II areas include Interstate 5, Highway 138, Highway 42, and some areas around existing recreation sites. Most public roads in rural residential areas such as portions of Highway 99, the Coos Bay Wagon Road, and Smith River Road are Class III in the inventory, and most logging access roads and other seldom seen areas are Class IV.

Wild and Scenic Rivers

BLM manages 8.4 miles out of a total 33.8 miles of the North Umpqua National Wild and Scenic River in cooperation with the Umpqua National Forest, the Oregon Scenic Waterways program, and the Oregon State Marine Board.

Table 3-30 and Map 3-9 show river stretches in the planning area which have been designated by Congress under the Wild and Scenic Rivers Act.

The Nationwide Rivers Inventory identifies three segments which cross or are within a quarter mile of BLM-administered lands in the planning area. Six river segments (Smith River, Cow Creek, South Umpqua River, Canton Creek, Umpqua main stem, and Little River) could have potential for national wild, scenic, or recreational river designation. BLM has applied to each of these river segments, eligibility and classification criteria established in U.S. Department of the Interior-Department of Agriculture guidelines evaluating a

Table 3-30. Designated Wild, Scenic, and Recreational Rivers

River Name	Total River Miles	BLM River Miles Wild	 Scenic	 Recreational	Current BLM Management
North Umpqua	33.8	0	0	8.4	1/4-mile on either side of the river (approximately 1446 acres) are protected from some surface-disturbing activities. Developed facilities: 12.5 miles hiking/riding trails; Susan Creek. Campground with 33 camping sites; Susan Creek picnic area; Susan Creek watchable wildlife site; Susan Creek whitewater launch site; and , Swiftwater day use area. Commercial river use is regulated by permit year round.

corridor extending a quarter-mile on each side of the segment. See Appendix 2-14 for a copy of these guidelines. The status of eligibility determinations for these rivers is shown in Table 3-31. Eligibility studies are available for review at the Roseburg District Office.

Five river segments (Smith River, Cow Creek, South Umpqua River, Canton Creek, and the main stem Umpqua) meet eligibility criteria for designation and thus would be eligible for suitability study based on their free flowing character and outstandingly remarkable values (see Map 3-9). Two of these river segments (Smith River and Canton Creek) are located in areas where BLM-administered lands provide substantial control of the river segment and will be studied in the RMP process to determine their suitability for wild and scenic river designation.

Recreation

The major recreation activities occurring on BLM-administered land in the planning area are camping, picnicking, hiking, horseback riding, mountain biking, whitewater boating, general sightseeing (driving for pleasure, viewing scenery, wildlife observation), hunting, fishing, and driving recreation vehicles on and off roads. Some of this activity is concentrated in developed recreation sites, but most is dispersed recreation activity occurring on roads, streams and rivers, and undeveloped forest lands.

All BLM-administered land falls into two recreation management categories - special recreation management areas (SRMA) and extensive recreation management areas (ERMA). Typically, SRMAs are sites or areas requiring substantial recreation investment and management. The SRMA label is applied to various types of areas such as high-use recreation sites, wilderness areas, wild and scenic rivers, and large areas with high recreation values. The North Umpqua River is the only SMRA in the planning area.

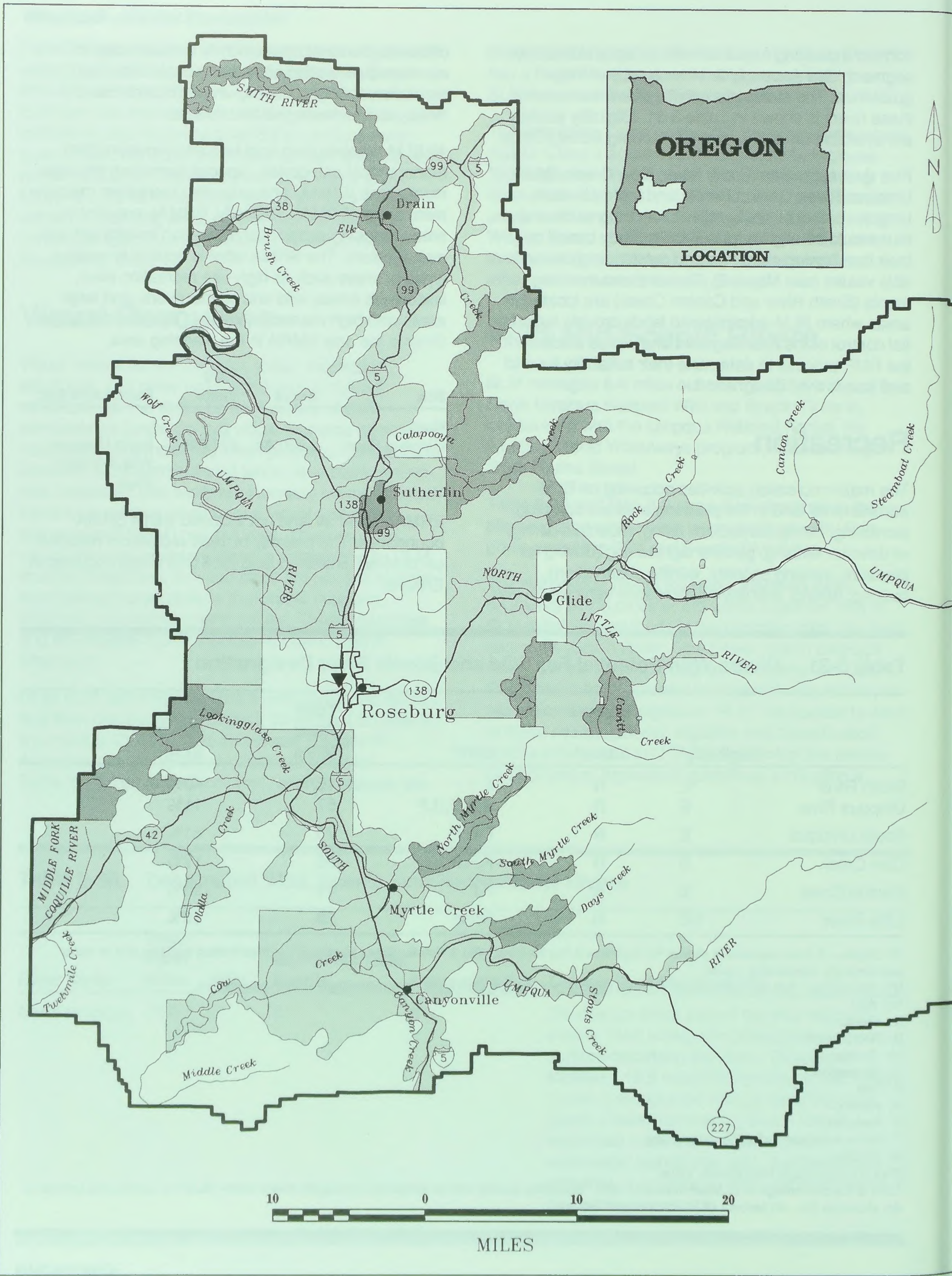
Site	Acres	1989 Visits	Descriptive Info
North Umpqua River	1,620 Ac.	137,600	North Umpqua Wild & Scenic River

ERMAs cover all land not included within SRMA boundaries. The majority of 1990 recreation visitation on BLM-administered land (566,300 visits) occurred in ERMAs.

Table 3-31. Rivers With Potential For Wild and Scenic River Designation

	Eligibility[1]	Highest Potential Class[2]	ORV[3]	Total River Miles	Percent BLM[4]
Smith River	E	R	F	15.1	40%
Umpqua River	E	R	S,R,F,H,P	57	11%
South Umpqua	E	R	F,H,P	73	<1%
Cow Creek	E	R	F,H,P	26	17%
Canton Creek	E	R	F,P	14	53%
Little River	NE	R	None	28	10%

[1] E: Eligible - A river segment is eligible for inclusion in the National Wild & Scenic Rivers System if it is free-flowing and has one or more outstandingly remarkable values.
NE: Not eligible - Not eligible because not free flowing, or not eligible because no outstandingly remarkable values.
[2] W: Wild
S: Scenic
R: Recreational
[3] S: Scenic
R: Recreation
F: Fish
H: Historic
P: Prehistoric
T: Native American Indian Traditional Use
W: Wildlife
ORV: Outstandingly Remarkable Value
[4] This is the percentage of BLM-administered land. Suitability studies will be completed on eligible rivers where BLM has substantial control of the shoreline (i.e., 40 percent BLM-administered lands).


OREGON
LOCATION
N
SMITH RIVER
99
5
38
Drain
Elk
Brush Creek
99
Creek
5
Wolf Creek
Calapooya
Creek
UMPQUA
Sutherlin
138
99
RIVER
Rock Creek
Canton Creek
Steamboat Creek
NORTH
Glide
UMPQUA
LITTLE
RIVER
5
138
Roseburg
Cavitt
Creek
Lookingglass Creek
5
North Myrtle Creek
South Myrtle Creek
42
Creek
MIDDLE FORK COQUILLE RIVER
SOUTH
Olalla
Myrtle Creek
Days Creek
RIVER
Twelvemile Creek
Cow
Creek
Canyonville
UMPQUA
Canyon Creek
Stouts Creek
5
Middle Creek
227
10
0
10
20
MILES

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1992 RMP/EIS

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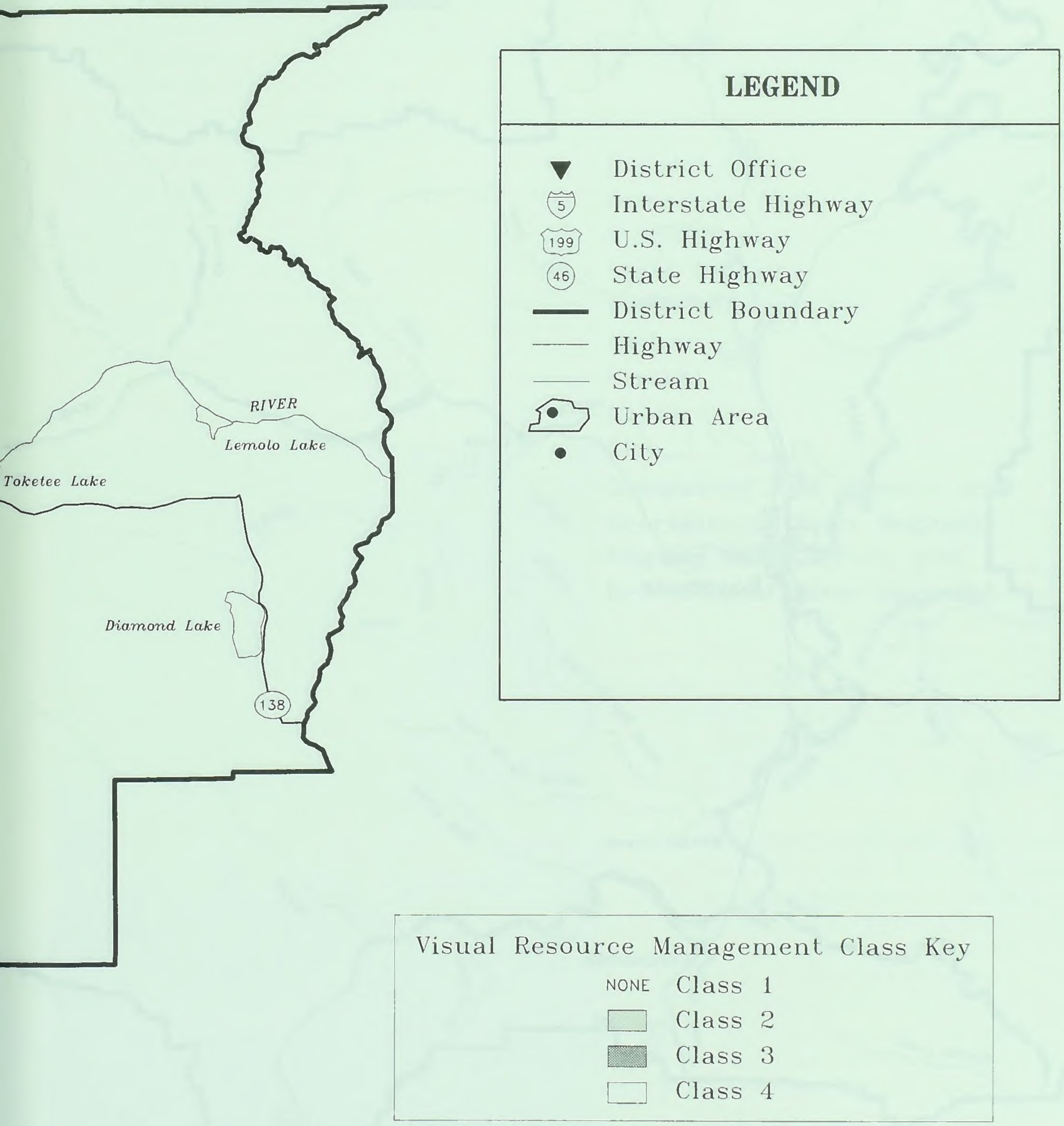
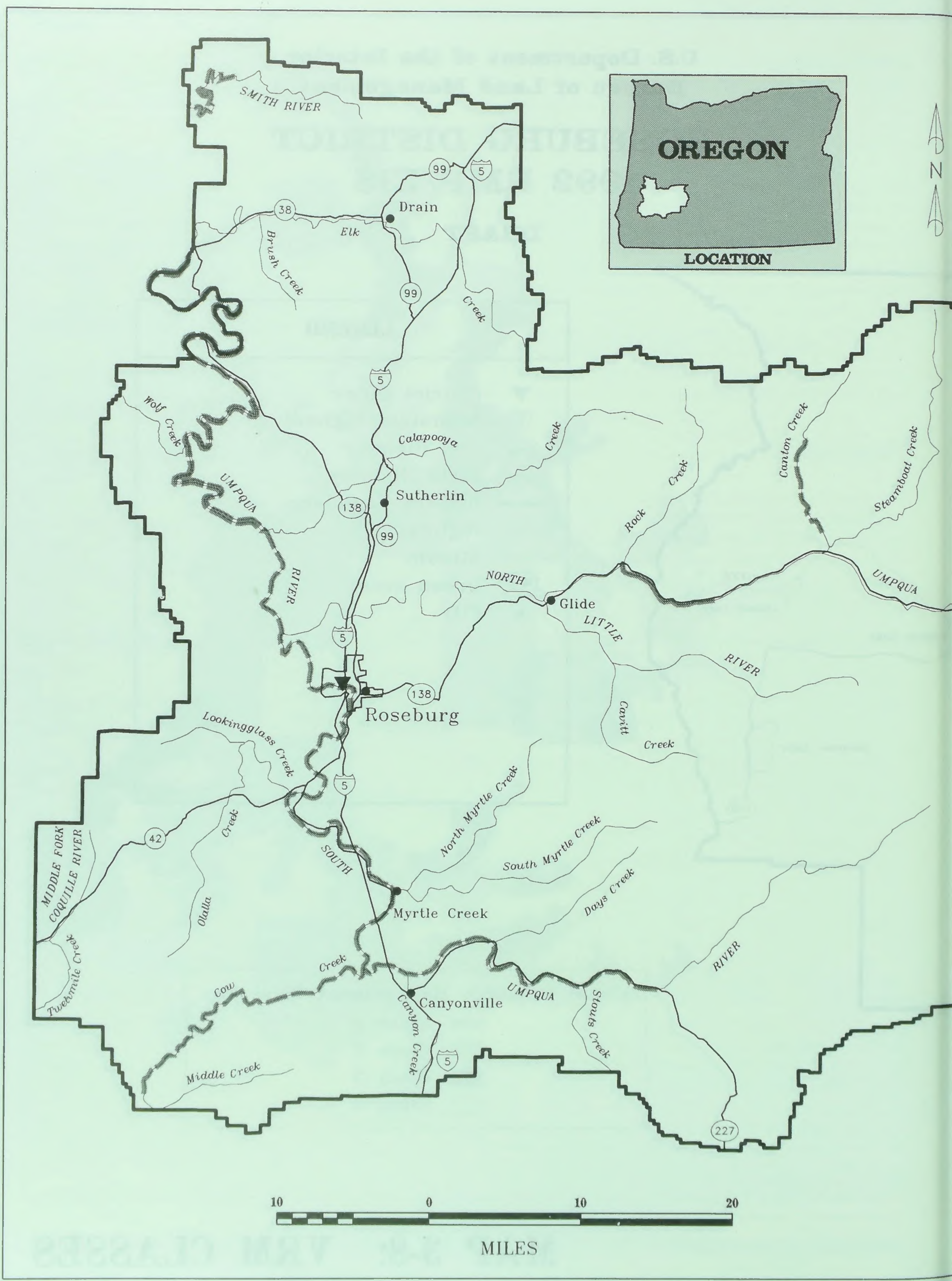


MAP 3-8: VRM CLASSES


OREGON
LOCATION
N
SMITH RIVER
Drain
Elk
Brush Creek
Creek
Wolf Creek
Calapooya
Creek
Sutherlin
UMPQUA
RIVER
NORTH
Glide
LITTLE
RIVER
Rock Creek
Canton Creek
Steamboat Creek
UMPQUA
Roseburg
Lookingglass Creek
Cavitt
Creek
North Myrtle Creek
South Myrtle Creek
Days Creek
SOUTH
Myrtle Creek
Creek
Olalla
MIDDLE FORK COQUILLE RIVER
Twelvemile Creek
Cow
Creek
Canyonville
Canyon Creek
UMPQUA
Stouts Creek
RIVER
Middle Creek
99
5
38
99
5
138
99
5
138
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42
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227
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MILES

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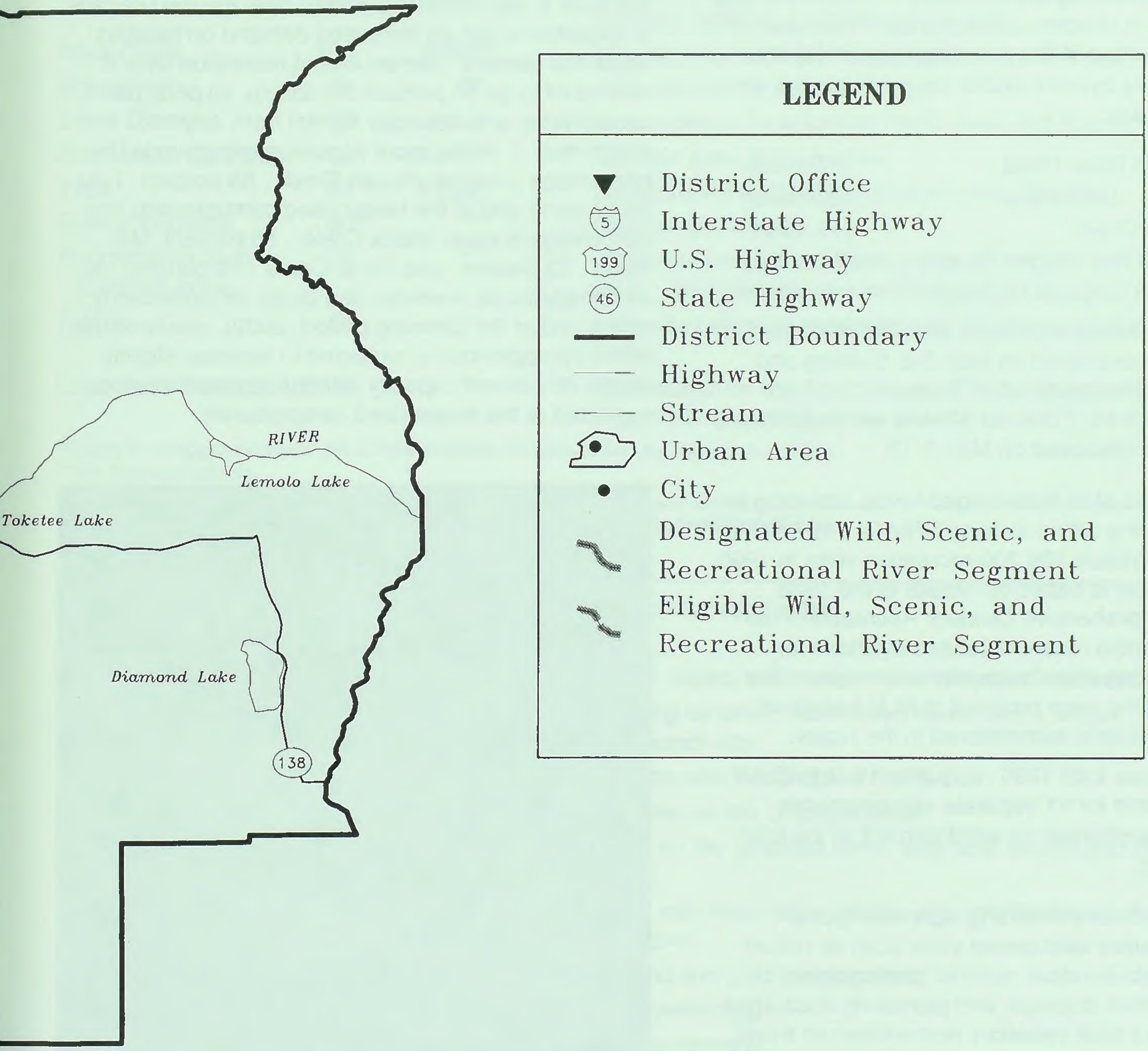


MAP 3-9: WILD, SCENIC, AND RECREATIONAL RIVERS

Within the planning area there are 10 BLM-developed and managed recreation sites; 13.5 miles of developed hiking/horseback riding trail; 756 miles of stream supporting fishable populations of trout and salmon; approximately 253,000 acres legally accessible to the public; and 2,250 miles of BLM-controlled roads open to motorized travel.

A recently initiated program in BLM is Back Country Byways. The purpose of the program is to identify and publicize scenic driving opportunities on lesser traveled roads through BLM-administered lands. There are no backcountry byways in the planning area at this time. Five backcountry byways and/or scenic highways are planned. They are:

1.	Smith River Road	(27 miles)
2.	Tyee - Loon Lake	(25 miles)
3.	Cow Creek	(19 miles)
4.	Coos Bay Wagon Road	(18 miles)
5.	North Umpqua Highway	(8 miles)

Existing and potential recreation sites are described in Table 3-32 and displayed on Map 3-8. Existing and potential trails are described in Table 3-33 and displayed on Map 3-10. Potential SRMAs are described in Table 3-34 and displayed on Map 3-10.

Recreational use of BLM-managed lands, including all activities occurring within existing SRMAs and ERMAs, totaled approximately 566,300 recreation visits in 1990. This use estimate is based on results of the 1988 Statewide Comprehensive Outdoor Recreation Plan (SCORP), the most recent database available for estimating existing districtwide recreational use. The SCORP estimates were prorated to BLM based on percent of forest land administered in the region.

Table 3-35 shows total 1990 recreation visits to BLM-administered land for 11 separate use categories. Hunting visits accounted for eight percent of the total recreation visits.

Motorized travel visits including sightseeing and exploring and other land-based visits such as nature study, wildlife observation, outdoor photography, visiting interpretive displays, and picnicking accounted for 17 percent of total visitation. Non-motorized travel visits such as day and overnight hiking/backpacking on trails, bicycling off the road and horseback riding and camping visits (all modes of overnight camping) accounted for another 29 percent. No other use category accounted for more than four percent of total visitation. Other land based visits such as picnicking, viewing wildlife, and nature study accounted for 19 percent.

Although conflicts between recreation uses may occur at times, there are no known significant conflicts on BLM-administered lands. There are thousands of acres of BLM-administered land in ERMAs and potential SRMAs, and recreation use at any given time and location is relatively light. The capacity of ERMAs and potential SRMAs to handle foreseeable recreation use will not be exceeded for many decades. However, use of the North Umpqua River SRMA is quite high during the spring and summer use season. An anticipated increase in use within this SRMA over the next decade is expected to put an increased demand on facilities within the corridor. Current use of recreation sites is estimated to be 80 percent of capacity on peak use days (Friday and Saturday nights) from July 1 to September 1. At the more popular campgrounds this percentage is higher (Susan Creek - 88 percent, Tyee - 86 percent) and at the lesser used campgrounds this percentage is lower (Rock Creek - 66 percent, Mill Pond - 73 percent, and Cavitt Creek - 79 percent). At all campgrounds weekday use drops off significantly. At the end of the planning period (2002), weekend use of the campgrounds is expected to increase slightly above 80 percent capacity with the largest increase expected at the lesser used campgrounds.

Canton Creek, Scaredman Recreation Area
Photo by Russ Holmes

Table 3-32. Existing and Potential Recreation Sites

Site	Acres	1991 visits	Existing Recreation Sites Amenities
Susan Creek	205	6,800*	33 campsites with an adjoining day-use picnic area on the North Umpqua River. Barrier-free Nature trail and Watchable Wildlife site. Fishing, showers.
Mill Pond	320	2,050*	12 campsites with an adjoining picnic area on Rock Creek. Pavilion, ballfield, small swimming hole.
Rock Creek	160	2,200*	17 campsites with adjoining picnic area on Rock Creek.
Scaredman	80	***	10 campsites on Canton Creek.
Cavitt Creek	80	1,000	8 campsites with adjoining Picnic Area and Scenic waterfall.
North Bank Swiftwater	80	10,000*	Day use area, fishing, kiosk
Tyee	24	2,300*	Campground with adjoining picnic area. Pavilion.
Gunter Wayside	80	***	Day use picnic area.
Recreational Gold Panning Area	20	***	Picnic area with picnic table and toilet. Gold panning and swimming.
E-Mile	80	***	Industrial campsite approximately 15 miles up Little River. Vault Toilets.
Lone Rock Boat Launch	6	***	Boat launch on the North Umpqua River up Lone Rock Road. Vault toilet and small picnic site.

*Refers to campground visits. No counts available for visits to the day use picnic facilities.
***No figures available.

Site	Acres	Potential Recreation Sites Amenities
North Umpqua Trail Primitive Campsite	2	Fire rings, composting toilet.
South Bank Swiftwater	1	2 or 3 picnic tables, vault toilet. North Umpqua Trail head.
Susan Creek Group Reservation site	2	Tent camping by group reservation reservation. Water, toilet, raft launch site.
Riverview	2	Day use area with Watchable Wildlife site.
Camp Tyee	5	Camping area on the Umpqua River.
Umpqua Boat Launch	10	Picnic area on the Umpqua River, with boat launch and Watchable Wildlife site.
Hardscrabble Rec.Site	30	Picnic area with Watchable Wildlife site, and fishing on the Umpqua River.
Island Creek	15	Campground and gold panning area.
Weaver Road Pond	5	Picnic site, swimming.
McNabb Creek Pond	5	Picnic site, swimming.
Michigan Springs	5	Picnic site, swimming, fishing.
Brickyard Pond	5	Picnic site, swimming.
Chimney Rock	5	Picnic site, swimming.
Poole Creek Boat Ramp	2	Boat launch and parking on South Umpqua River.
Lavadoure Boat Ramp	2	Boat launch and parking on South Umpqua River.
Red Top Pond	5	4 campsites, picnic tables, toilet.
Iron Mt. Gold Panning Area	5	Picnic site, gold panning and swimming.

Table 3-33. Existing and Potential Recreation Trails

Existing	Miles	1990 Visits	Other Descriptive Information
North Umpqua Trail	11.0	2,000	First segment of a 77.5 mi. trail connecting Swiftwater to Pacific Crest Trail.
Susan Creek Falls	1.0	4,000	Accesses Susan Creek Falls and Indian mounds picnic area & parking at trailhead.
Wolf Creek Falls	1.0	2,000	Accesses Wolf Creek Falls.
Susan Creek Camp - ground Trail	0.4	4,000	Barrier free trail with Watchable Wildlife site and outdoor theatre.
Deadline Falls Trail	0.1	***	Barrier free trail with Watchable Wildlife site.
Potential			
Cow Creek Bluffs	3		Would access rock bluffs overlooking Cow Creek.
Cow Creek Trail	4		Would provide foot access through unique serpentine area.
Deadman Mtn. Trail	10		Would provide trails in the Deadman - Louis Creek Area for hikes, mtn. bikers and equestrians.
Wolf Creek Falls Trail extension	2		Would extend off the end of existing Wolf Creek Trail. Provide foot access to upper Falls.
Upper Susan Creek Trail	1		Would provide foot access to Upper Susan Creek Falls.
Susan Creek Falls Barrier Free Trail	0.5		Would provide barrier-free access to Lower Susan Creek Falls. Tie into existing trail for a loop trail. Interpretive opportunities.

*** No figures available.

Recreational Access

An exclusive road easement is acquired when public access to BLM-administered lands is desired.

At present 60 percent of the lands in the planning area are legally accessible to the public, however, due to the terrain many of these lands are not physically accessible. In this context legally accessible means that the public can enter BLM-administered land by foot from a State Highway, County Road, a BLM road with exclusive easements, or by walking from another parcel of BLM-administered land which has legal access. It does not include any use of BLM roads on nonexclusive easements, BLM roads built under reciprocal right-of-way agreements, or crossing at section corners with contiguous private lands.

Many BLM-administered lands and roads the public now uses do not actually have legal access but the landowner or permittee allows the public to use these roads. However, the landowner could legally close these roads at any time. It also should be noted that although BLM roads may provide legal access they are not public roads as are State Highways and County Roads. The BLM may, by management decision, close BLM roads to the public.

Timber Resources

In 1977 district lands were inventoried for their physical and biological capabilities to support and produce forest products on a sustained yield basis (BLM Handbook 5251-1). This inventory is the Timber Production Capability Classification (TPCC) system. District lands were reinventoried in 1988 using the current TPCC system. Differences in terminology, structure and district acreage prevents direct comparisons of the inventories. Table 3-36 displays the results of the TPCC as of October 1, 1988.

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
SUSAN CREEK
Recreation Site
CAMPGROUND

Boy Scout Troop 119, Winchester, Adopt-a-camp program.

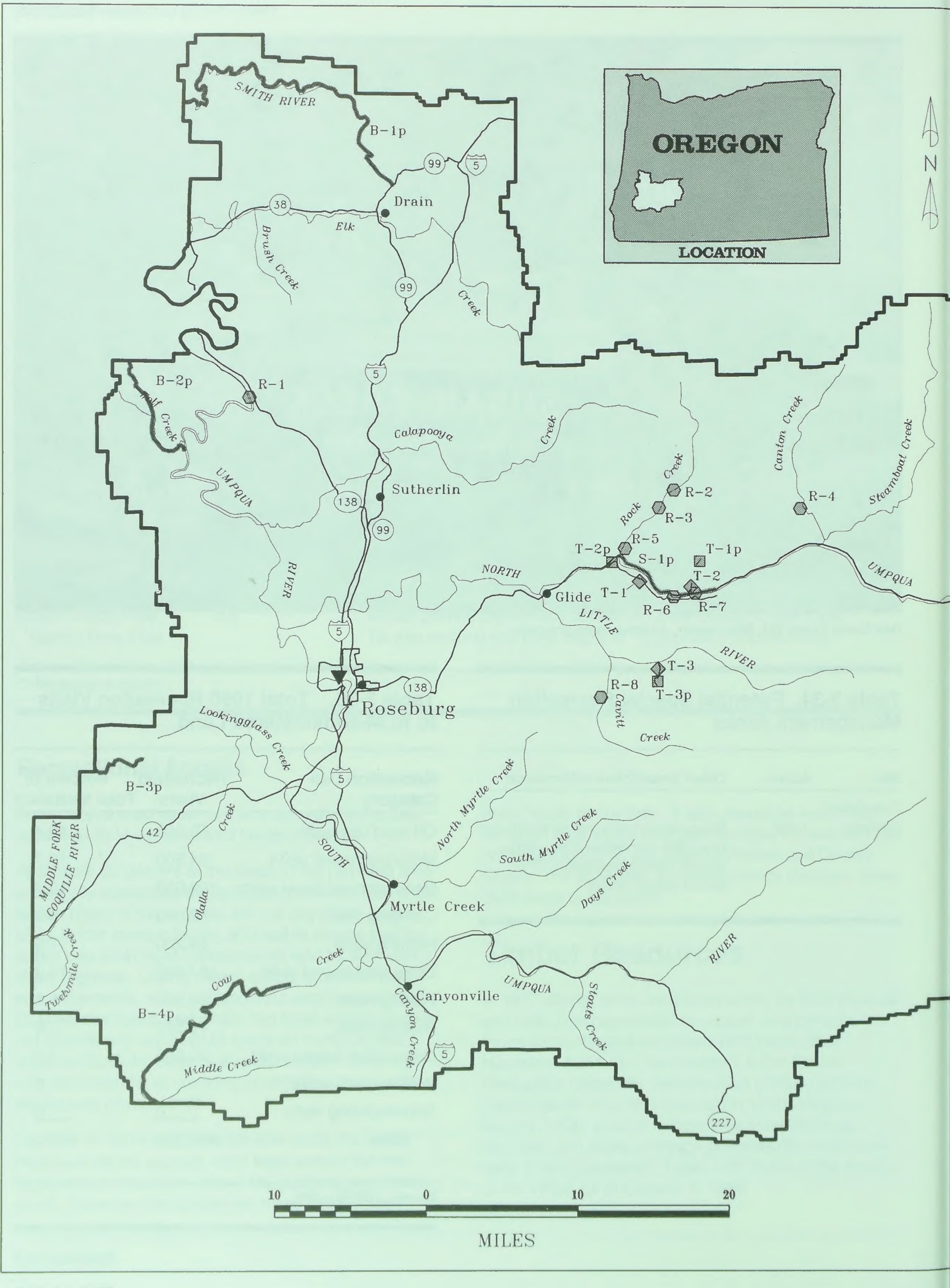
Table 3-34. Potential Special Recreation Management Areas

Site	Acres	Other Descriptive Information
Cow Creek Canyon	1,520	River canyon with scenic vistas and proposed recreation sites, recreational mining, swimming. Proposed scenic byway.

Table 3-35. Total 1990 Recreation Visits to BLM-administered Land

Recreation Use Category	Recreation Visits	Percent of Total Visitation
Off-road use visits	59,000	10.4
Motorized travel visits	94,500	16.7
Nonmotorized travel visits	109,500	19.3
Camping visits	52,800	9.3
Hunting visits	44,200	7.8
Other land-based visits	107,000	19.0
Fishing visits	62,500	11.0
Boating visits	16,500	2.9
Other water-based visits	20,500	3.6
Winter sports visits	0	0
Snowmobiling visits	0	0
Total	566,300	100%

Source: OSPRD 1988.


OREGON
LOCATION
N
SMITH RIVER
B-1p
99
5
Drain
38
Elk
Brush Creek
99
Creek
5
B-2p
R-1
Wolf Creek
Calapooya
Creek
UMPQUA
Sutherlin
138
99
RIVER
NORTH
Rock Creek
R-2
R-3
R-5
T-2p
S-1p
T-1p
T-2
T-1
Glide
R-6
R-7
Canton Creek
R-4
Steamboat Creek
UMPQUA
LITTLE
RIVER
T-3
T-3p
R-8
Cavitt Creek
5
138
Roseburg
Lookingglass Creek
5
B-3p
42
Creek
North Myrtle Creek
South Myrtle Creek
SOUTH
Days Creek
MIDDLE FORK COQUILLE RIVER
Olalla
Myrtle Creek
Twelvemile Creek
Creek
Cow
RIVER
UMPQUA
Canyonville
Canyon Creek
Stouts Creek
B-4p
Middle Creek
5
227
10
0
10
20
MILES

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ROSEBURG DISTRICT
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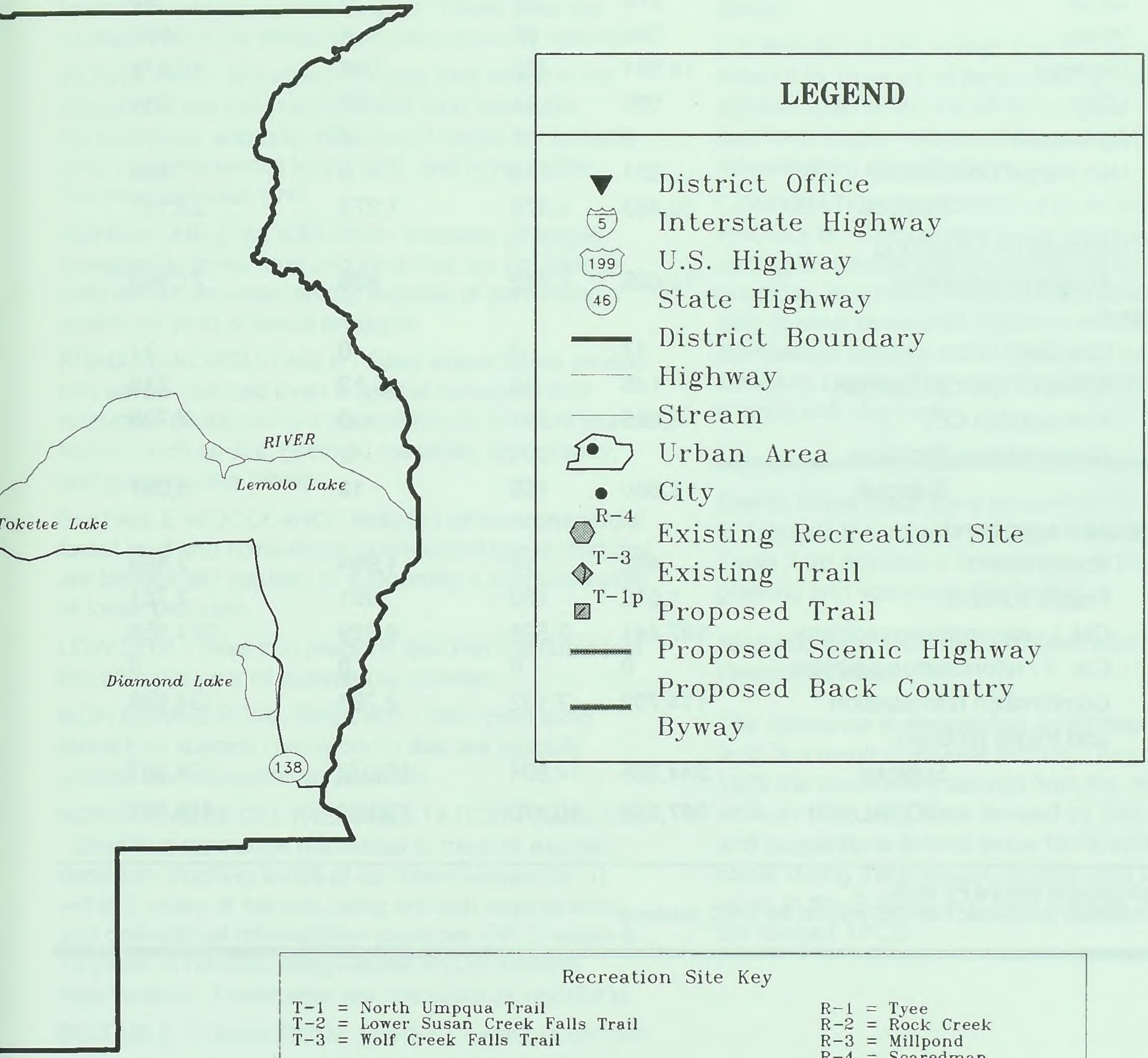

Recreation Site Key

T-1 = North Umpqua Trail
T-2 = Lower Susan Creek Falls Trail
T-3 = Wolf Creek Falls Trail

T-1p = Upper Susan Creek Falls Trail
T-2p = Narrows Trail
T-3p = Wolf Creek Trail Extension

B-1p = Smith River Road Back Country Byway
B-2p = Loon Lake Road Back Country Byway
B-3p = Coos Bay Wagon Road Back Country Byway
B-4p = Cow Creek Road Back Country Byway

R-1 = Tyee
R-2 = Rock Creek
R-3 = Millpond
R-4 = Scaredman
R-5 = Swiftwater
R-6 = North Umpqua Wild & Scenic River
R-7 = Susan Creek
R-8 = Cavitt Creek

S-1p = North Umpqua Scenic Highway

MAP 3-10: RECREATION SITES

Table 3-36. District TPCC Summary 1988

		Acres		
	O&C	**PD**[1]	**CBWR**	**Total**
Non-Forest				
Rockland	3,301	682	681	4,664
Brush	78	0	0	78
Grass	315	73	0	63
Water	996	68	1	1,065
Highway	14,884	422	566	15,872
Utility	598	11	25	634
Agriculture	0	0	0	0
Non-Forest Unclassified	321	119	0	440
Subtotal	20,493	1,375	1,273	23,141
Non-suitable Woodland				
· Fragile non-suitable	19,625	1,742	626	21,993
Suitable Woodland				
· Low Site	37	0	0	37
· Non-Commercial Species	148	58	12	218
· Non-suitable CFL (Reforestation Problem)	2,695	101	0	2,796
Subtotal	2,880	159	12	3,051
Suitable Commercial Forest Land				
· Non-problem	482	14	1,964	2,460
· Fragile suitable	1,610	160	991	2,761
· Cat. I - reforestation problem	197,441	7,588	6,329	211,358
· Cat. II - reforestation problem	0	0	0	0
· Combination reforestation and fragile problem	114,702	7,132	2,794	154,628
Subtotal	344,235	14,894	12,078	371,207
TOTAL	**387,233**	**18,170**	**13,989**	**419,392**

[1] Acquired Lands are included with the PD totals.

Source: Acreage estimates are derived from GIS acres in the TPCC database

The TPCC classifications are described in Table 3-37.

Table 3-37. Definition of Classifications used in the 1988 TPCC

NONFOREST LAND - Sites within the forest zone that are not capable of maintaining at least 10 percent stocking of forest trees and those sites which have been converted to nonforest uses. These sites are excluded from the timber production base by definition.

WOODLAND - Woodland is forest land which is not included in the commercial forest land allowable harvest base, and also includes all fragile nonsuitable land, noncommercial forest land, and nonsuitable commercial forest land.

NONSUITABLE WOODLAND - Includes all fragile nonsuitable forest land and sites that are not biologically and/or environmentally capable of supporting a sustained yield of forest products.

FRAGILE-NONSUITABLE - Sites where future production will be reduced even if special harvest and/or restrictive measures are applied due to inherent site factors such as soil, geologic materials, topography, and groundwater tables.

SUITABLE WOODLAND - Includes all noncommercial forest land and nonsuitable commercial forest land that are biologically capable of supporting a sustained yield of forest products.

LOW SITE - Sites that produce less than 20 cubic feet per acre per year of commercial species.

NON-COMMERCIAL SPECIES - Sites producing forest tree species (hardwoods) that are typically utilized as nonsawtimber products.

NONSUITABLE CFL (REFORESTATION PROBLEM) - Sites that cannot be reforested to meet or exceed minimum stocking levels of commercial species: 1) within 5 years of harvest using artificial regeneration and operational reforestation practices OR 2) within 6-15 years of harvest using natural and/or artificial regeneration. These sites are classified as woodland.

SUITABLE COMMERCIAL FOREST LAND - Commercial forest land which is determined to be capable of sustaining long-term timber production.

COMMERCIAL FOREST LAND (CFL) - All forest land that is capable of yielding at least 20 cubic feet of wood per acre per year of commercial tree species.

NON PROBLEM - Commercial forest land that can be stocked to meet or exceed target stocking levels, of commercial species, within 5 years of harvest using standard practices and that is classified nonfragile. Standard practice is one site preparation treatment that provides adequate planting spaces (if needed), and one planting following the regeneration harvest.

FRAGILE-SUITABLE - Sites where forest yield productivity may be reduced due to soil erosion, mass wasting, reduction of nutrient levels, reduction of moisture supplying capacity, and/or rise in groundwater tables.

CATEGORY I CFL - Sites that can be reforested within 5 years of harvest using artificial regeneration and operational reforestation practices OR natural regeneration.

CATEGORY II CFL - Sites that can be reforested within 6 to 15 years of harvest using natural and/or artificial regeneration in all forest types. These sites can have fragile, reforestation, or dual (fragile and reforestation) classifications.

COMBINATION REFORESTATION AND FRAGILE PROBLEM - Commercial forest land that is classified as fragile suitable where operational reforestation practices, in addition to standard practices, are necessary to meet or exceed minimum stocking levels of commercial species within 5 years of harvest for Category I lands. The regeneration period for Category II lands is 6-15 years.

District forest lands were inventoried in 1978 and 1988 to estimate the volume and age class distribution. Table 3-38 displays a comparison of the volume growing and age class distribution.

Appendix 3-10 provides additional information on inventories used.

The difference in inventoried acres displayed in Table 3-38 is a result of several factors. They are primarily: in 1978 the acres were derived from the master title plat, while in 1988 they were derived by GIS; exchanges and acquisitions of land since 1978; construction of roads during the previous decade; and the deduction of acres in the Suitable and Non-suitable categories of the revised TPCC.

As shown in Table 3-38 there is approximately the same volume in the 1988 inventory as in the 1978 inventory. Reasons for the similarity include:

— Inclusion of volume less than 40 years old in the 1988 data but not in the 1978 data:

— Inclusion of hardwood volume in 1988 data but not in 1978 data; and,

— Differences in data analysis techniques between 1988 and 1978.

There are basic differences in the structure of the two inventories that make direct comparisons difficult. The 1977 and 1988 TCPP partitioned the land base differently. The 1988 TPCC does not contain categories incorporated in the 1977 version including: limited management, adverse location, or statutory withdrawal classifications. These lands were reclassified in 1988, with the majority being included in the Non-suitable woodland, Suitable woodland, or Category II CFL classifications. There were also differences in the guidlines set out for stocking criteria and the definitions

Table 3-38. Comparison of District Inventory Data

Age Class	GLO[1] Acres 1978	GIS[2] Acres 1988	Cubic Volume(Mcf) 1978	Cubic Volume(Mcf) 1988	Board Foot Volume (MMbf) 1978	Board Foot Volume (MMbf) 1988
0	7,403	22,065	0	33	0	0
1-5	25,510	19,393	0	606	0	3
10	40,853	40,315	0	1,376	0	7
20	35,945	29,316	0	11,755	0	59
30	13,852	32,525	22,805	50,132	118	258
40	5,973	13,362	12,950	41,236	68	217
50	7,558	8,201	19,463	34,184	104	183
60	11,319	4,271	33,483	18,152	183	99
70	8,959	5,389	30,162	31,059	168	173
80	10,931	6,211	40,831	34,731	231	197
90	11,741	10,312	47,854	88,411	275	509
100	13,282	9,865	58,885	85,807	343	502
110	16,879	8,276	80,544	57,938	475	344
120	15,852	14,215	80,151	79,847	480	480
130	3,595	15,744	19,293	107,540	116	658
140	3,595	5,677	20,222	35,537	123	218
150	10,545	4,969	62,067	37,537	377	234
160	5,615	2,760	34,170	21,103	215	131
170	6,197	5,788	38,565	44,472	237	281
180	21,947	3,532	144,301	23,804	937	151
190	8,305	5,101	52,991	27,430	327	168
200+	105,214	103,763	801,335	836,071	5,285	5,396
Total	**391,070**	**371,050**	**1,600,072**	**1,668,761**	**10,062**	**10,268**

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[1] URA 4 Land Base, GLO acreage estimates with deductions for congressional designation, TPCC withdrawals, and a reduction for roads.

[2] Forest Operations Inventory (FOI) GIS acreage estimates with deductions for non-forest, roads, suitable woodlands and non-suitable woodlands.

of standard silvicultural operations for making the TPCC classifications. A more detailed description of these differences are contained in Appendix 3-10.

Table 3-39 displays the volume by ownership and timbershed as reported in "Timber for Oregon's Tomorrow" the 1989 update.

Of the 522,000 available BLM acres shown in Table 3-39, the Roseburg District administers approximately 367,500 acres (70 percent). Virtually all of the lands the district administers lie in Douglas County (exception: 320 acres - Jackson County; 280 acres - Lane County). Roseburg District Administration covers 24 percent of available Douglas County lands and 46 percent of all available Federal lands in the county. About 30 percent of the available growing stock in Douglas County is BLM.

The Roseburg Timbershed is comprised of Douglas County.

Beargrass collecting - a minor forest product.

Table 3-39. Forest Area and Growing Stock, by Owner for the Roseburg Timbershed (1989)[1]

Roseburg Timbershed (Douglas Co.)	Forest Land Available (thousand acres)	Forest Land Not Available (thousand acres)	Total Forest Land (thousand acres)	Available Growing Stock [2] (million cubic feet)
Public				
National Forest	611	285	896	2,602
Bureau of Land Management[3]	522	77	599	2,206
State and Other	39	9	48	219
Private				
Forest Industry	750	9	750	1,586
Non-industrial	287	0	287	663
Total:	**2,209**	**380**	**2,580**	**7,276**

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[1] Johnson, K. Norman; John Bueter, et al. 1990. Timber for Oregon's Tomorrow - the 1989 Update.

[2] National Forest growing-stock data are based on 9-inch dbh to a 6-inch top for natural stands and 7-inch dbh to a 4-inch top for managed stands. BLM and state data are based on 7-inch dbh to a 4-inch top for all stands. Private data are based on 5-inch dbh to a 4-inch top for all stands.

[3] Includes acres administered by Roseburg, Eugene, Coos Bay and Medford Districts.

The data presented in this table cannot be compared directly with Table 3-38 as portions of the Medford, Coos Bay and Eugene Districts are within the Roseburg timbershed.

Until 1987, Douglas County led the nation in timber harvested. Lane County now leads by a small margin. These harvests can be attributed to county size and forested area, with stands of high volume per acre. The Roseburg District is almost 100 percent within Douglas County.

Table 3-40 displays the volume of timber harvested by county and ownership. As in Table 3-39 the data presented encompasses harvest from more than one district.

Table 3-40. Volume Harvested by County and Ownership Thousand Board Feet (Scribner Log Scale)[1]

Calendar Year	County	Forest[2] Industry	Other[2] Private	State	BLM[3]	National[4] Forest	Other[2] Public	Total
1977	Douglas	648,805		22,530	299,476	298,334	0	1,269,145
	Lane	329,623		13,636	163,699	602,334	0	1,109,292
	Jackson	116,365		41	83,374	139,392	0	339,172
1978	Douglas	665,617	48,169	27,044	92,070	412,748	25	1,245,673
	Lane	324,304	33,406	7,464	204,587	588,891	0	1,158,652
	Jackson	136,463	13,465	778	96,450	163,891	0	411,047
1979	Douglas	676,384	20,993	17,341	277,803	376,435	415	1,369,371
	Lane	369,380	29,672	1,965	139,571	705,070	0	1,245,658
	Jackson	95,194	7,692	168	114,749	158,311	0	376,114
1980	Douglas	729,556	23,501	13,944	186,545	181,722	488	1,135,756
	Lane	309,605	15,623	17,031	144,031	493,188	0	979,478
	Jackson	87,996	8,525	5	87,417	133,632	0	317,575
1981	Douglas	598,577	19,478	6,779	199,894	170,716	0	995,444
	Lane	315,894	13,256	2,901	118,448	328,373	130	779,002
	Jackson	52,821	7,271	762	65,872	137,236	0	263,962
1982	Douglas	694,122	39,970	18,203	68,431	137,826	85	958,637
	Lane	488,718	21,449	6,632	82,282	347,781	14	946,876
	Jackson	104,368	2,415	0	17,877	62,011	78	186,749
1983	Douglas	677,539	36,411	2,297	217,103	318,592	0	1,251,942
	Lane	444,651	38,141	11,621	120,113	477,354	160	1,092,040
	Jackson	118,726	6,117	11	96,652	173,613	208	395,327
1984	Douglas	646,848	32,880	11,015	261,391	324,498	1,833	1,278,465
	Lane	414,599	33,320	6,550	139,646	594,070	12	1,188,197
	Jackson	112,509	9,286	0	100,945	118,683	0	341,423
1985	Douglas	636,113	35,692	23,779	290,188	327,008	286	1,313,066
	Lane	433,606	46,404	12,762	165,750	626,040	20	1,284,582
	Jackson	189,978	4,441	1,698	81,263	182,683	26	460,089
1986	Douglas	591,435	38,227	31,608	349,410	492,455	50	1,503,185
	Lane	454,691	34,477	6,407	194,221	646,725	537	1,337,058
	Jackson	186,084	3,350	1,077	73,418	142,398	0	406,327
1987	Douglas	471,437	30,854	21,645	378,054	406,283	3,274	1,311,547
	Lane	464,156	46,394	288	183,463	633,954	0	1,328,255
	Jackson	118,893	6,730	3,338	103,921	131,689	0	364,571

[1] Includes volume removed (softwood and hardwood) as logs, poles and pilings but not volume removed from woodcutting operations.
[2] Compiled by Oregon State Department of Revenue.
[3] Compiled by Bureau of Land Management.
[4] Compiled by United States Forest Service, Region 6.

Source: Oregon Timber Harvest Reports, Oregon State Department of Forestry

Energy and Mineral Resources

Since 1980, mineral activity on BLM-administered lands in the planning area has consisted primarily of rock production for construction and maintenance of BLM and private logging roads and county and state roads and highways. Exploration for locatable minerals has been minimal with only 100 notices and no plans of operation having been filed in the last ten years. Approximately 170 acres of mineral land has been patented over the last ten years. It is not expected that this amount will be exceeded over the next ten years. Leasable mineral exploration consisted of seven notices of intent to conduct geophysical work for oil and gas, and no notices of intent for geothermal exploration. From 1980 to 1985, 12 oil and gas leases covering 17,880 acres were issued. The Roseburg BLM has jurisdiction over oil and gas leasing on Forest Service lands to the crest of the Cascades. No significant activity is expected during the life of this plan. All but one of these leases were relinquished or terminated.

As of May, 1991 there were about 1750 mining claims, 30 active mining notices and no plans of operation on file. One 640 acre oil and gas lease and no geothermal leases are on file. There were seven oil and gas notices of intent but no geothermal notices of intent on file. Average annual rock production from BLM quarries and pits is 440,000 cubic yards per year from approximately 190 active sources. The BLM administers the mineral estate for 423,928 acres of public land and 1,717 acres of split estate (federally owned minerals with non-federally owned surface).

Based upon known occurrences, geological environment/inference, exploration activity, geochemical/geophysical anomalies, etc., there is potential for the occurrence of the following locatable minerals: gold, silver, copper, zinc, chrome and others. Leasable mineral potential in the planning area includes oil and gas and geothermal resources. An identified or theorized geologic environment (the existence of or potential for source rock and a trapping mechanism), suggests moderate potential for gas. Generally, a low-potential is indicated districtwide for geothermal resources as there are no Known Geothermal Resource Areas or thermal springs. A moderate potential is indicated for the Cascade Providence based on quarternary volcanism. Rock suitable for sale as road construction material is available throughout the district but varies significantly in quality.

It is the Bureau's policy to encourage exploration and development of minerals using environmentally sound practices. Table 3-41 summarizes mineral potential for locatable, salable, and leasable minerals, and Map 3-11 displays the areas of potential. Mineral potential, as used in this document, refers to the potential for the occurrence, not the development, of a mineral.

Table 3-42 lists the areas of critical mineral potential in the planning area and their associated minerals.

Socioeconomic Conditions

The Roseburg District is located in southern Oregon and includes lands in Douglas, Lane, and Jackson counties. For the purposes of socioeconomic description the Roseburg District has been equated to Douglas county. Information regarding population, employment, and personal income has been examined to determine the basic structure and scope of the economy in the region. A 1984-1988 baseline has been selected to represent average economic conditions in the region. A summary for the region has been provided, however, detailed information has not been displayed. The selected baseline encompasses a period of national growth that followed the recession of the early 1980s. Douglas county, like many non-

Table 3-41. Mineral Potential

Mineral Type	Mineral Potential (Acres) Low	Moderate	High	Total
Locatable	2,405,218	221,260	61,733	2,688,212
Salable		Not Classified		
Leasable (Oil and Gas)	1,684,424	1,003,784	0	2,688,209
Leasable (Geothermal)	2,210,627	477,430	0	2,688,057

Table 3-42. Areas of Critical Mineral Potential

Name[1]	Size (Acres)	Minerals(s)
OR 100001	221,258	M = Gold, silver, platinum, chromite, asbestos, serpentine
OR 100002	5,445	H = Gold, silver, nickel
OR 100003	10,511	H = Gold, M= Silver
OR 100004	14,506	H = Gold, silver, nickel, chromite, cobalt, serpentine
OR 100005	16,537	H = Gold, silver
OR 100006	120	H = Limestone
OR 100007	44	H = Limestone
OR 100008	132	H = Limestone
OR 100009	38	H = Limestone

[1] = Listed by GIS polygon number - See Roseburg District Office for specific information.
M = Medium potential.
H - High potential.

metropolitan areas of the state, was slower to show economic growth after the recession, one indicator of the limited economic diversity that still exists today. Additional information regarding recent trends has been included when available to provide a context for current decisions.

Population

During the baseline period population in Douglas county averaged 92,450. The 1990 Census population as reported by Portland State University's Center for Population Research and Census was 94,649, with 58 percent of those persons living in unincorporated areas. Excluding the recessionary period of the early 1980s, Douglas county has shown increasing population since 1980, with 1981, 1982, 1983 and 1990 the only years experiencing population losses. Even with population gains in other years net migration out of the county is estimated at 4,614 between 1980 and 1990. Decreasing population trends often follow decreases in employment opportunities. Employment statistics, discussed in the following section, demonstrate the reduced employment opportunities during the baseline period. Demographic information suggests that 15 percent of Douglas county's population is over 65, this approximates the statewide average of 14 percent.

Employment

Southern Oregon has traditionally been economically dependent upon natural resources. Timber, fisheries, agriculture, and recently tourism provide significant employment in the region. The wood products sector (including paper) is the largest employer in the county, employing an average of 8,240 persons (1984-88). Trade (6,110) and government sectors (6,430) also generated significant employment in the region during the baseline period. In 1989 and 1990 employment in the wood products industry decreased significantly. Between January 1989 and January 1991 the Oregon Employment Division recorded twenty cutbacks or closures in the wood products sector affecting 1,788 jobs in Douglas county. This is over 21 percent of the average (1984-1988) wood products employment in the county. Employment in this economic sector is particularly sensitive to raw material supply and overall economic health. Employment in the wholesale and retail trade industries and in the service sectors increased during the baseline period. Government employment (includes federal, state and local governments, and public education) also increased during the baseline period. Overall employment growth in the region has been slow, suggesting a combination of out-migration from the area and frustrated workers leaving the labor force.

Unemployment rates in the county have generally decreased since 1984. Unemployment in the county peaked at a high of 17.2 percent in 1982 declining to a low of 7.6 percent in 1987. Unemployment rates in Douglas county began a pattern of increases in 1988. This trend has continued through 1990, the last year data was available.

Personal Income

Personal income information is an indicator of wealth in a particular area. This is because income statistics track both wage and non-wage income sources. Non-wage income sources include transfer payments, interest, dividends and rent. In Douglas county, where a large portion of residents are retired, this is of particular importance. Retired persons derive income from a variety of sources other than wages. Per capita income in Douglas county averaged 11,658 dollars during the 1984-1988 baseline. Statewide, average per capita income was slightly higher than in the county, average 13,308 dollars. In recent years the trend has been a widening of this gap.

Local Resources

Douglas County has developed an economic plan to support the county's economy thorough policies that encourage the maintenance and expansion of existing industries and to increase the number, variety and types of products manufactured and services rendered. The objectives also address reducing existing unemployment and creating employment opportunities to promote growth of the county's labor force.

The Coos, Curry and Douglas County (CCD) Business Development Corporation was established in 1971 to serve as an overall focal point for economic development throughout the three-county area. CCD is usually the lead organization in working with a firm, existing or new to the area, who may be looking for a new site, financing, or both, to do business in the region. Since 1985, three new business have located in the Roseburg area, creating approximately 210 new jobs.

Douglas County Industrial Development Board was set up by the Douglas County Board of Commissioners and has the authority to acquire land for industrial development, either alone on in conjunction with other local governments in the county. This makes Douglas the first county in Oregon to create its own economic development board. To date, the county has budgeted over $2 million for projects, primarily for its industrial facility financing program.

The Umpqua Community College Small Business Development Center is part of a statewide network created by the Oregon Legislature to provide small business owners with training and assistance, consequently decreasing the number of small business failures.

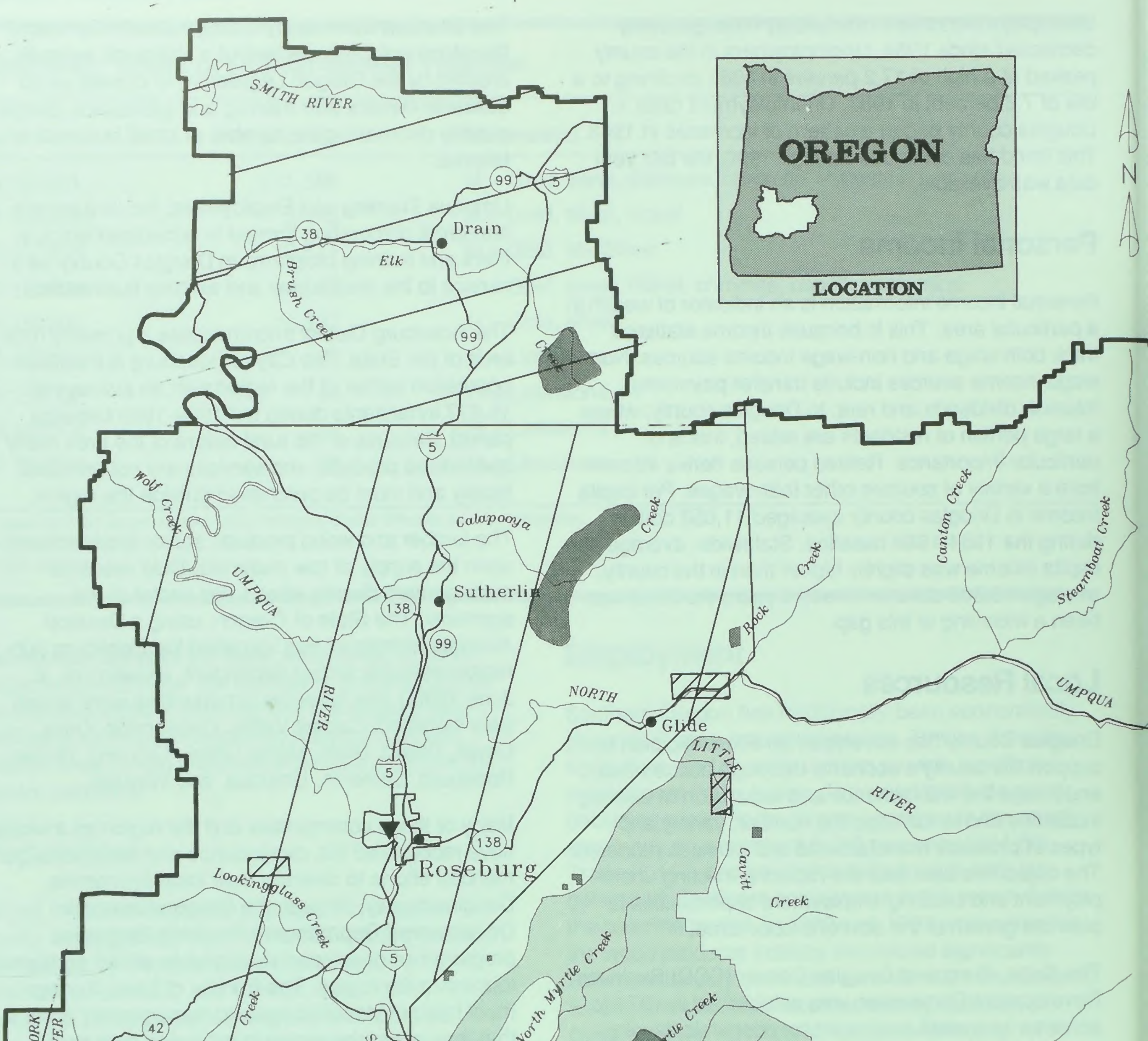
Umpqua Training and Employment, Inc. is a private non-profit corporation formed to administer employment and training programs in Douglas County as a service to the area's new and existing businesses.

The Roseburg District encompasses a primarily rural area of the State. The City of Roseburg is the major population center of the region with an average of 15,977 inhabitants during the 1984-1988 baseline period. Because of the rural nature of the area many specialized products and services are not provided locally and must be purchased outside the region.

The lumber and wood products sector is dependent upon the supply of raw materials. BLM resource management directly effects this sector of the economy. The State of Oregon, using a Desktop Analysis technique, has identified the Roseburg subregion as highly timber dependent. (Bowling et. al. June 1990.) The following communities were specifically identified: Camas Valley, Canyonville, Days Creek, Dillard, Glide, Myrtle Creek, Oakland, Riddle, Roseburg, Sutherlin, Umpqua, and Winston.

Many of these communities and the region as a whole have recognized this dependence and have commenced efforts to diversify their local economies. Douglas county, through the Oregon Economic Development Department's Regional Strategies program has developed strategies to attract additional tourism to the region. The Bureau of Land Management has not identified specific management actions that may assist the region in achieving their goal.

Another example of local efforts to diversify local economies is centered in the South Umpqua Valley. The communities of Myrtle Creek, Riddle, Canyonville and Tri-City have developed a strategy to recruit and support new and existing industries. This includes steps to identify potential industrial sites and to target light and advanced manufacturing for location in the region. Through these programs local areas can seek special funding from the State to achieve the identified objectives. Again, the Bureau of Land Management has not identified specific management action that may assist the region in achieving their development goals. (Southern Umpqua Valley Economic Development Committee Action Plan. June 1990.)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COQUILLE RIVER
Myrtle Creek
Days Creek
Olalla
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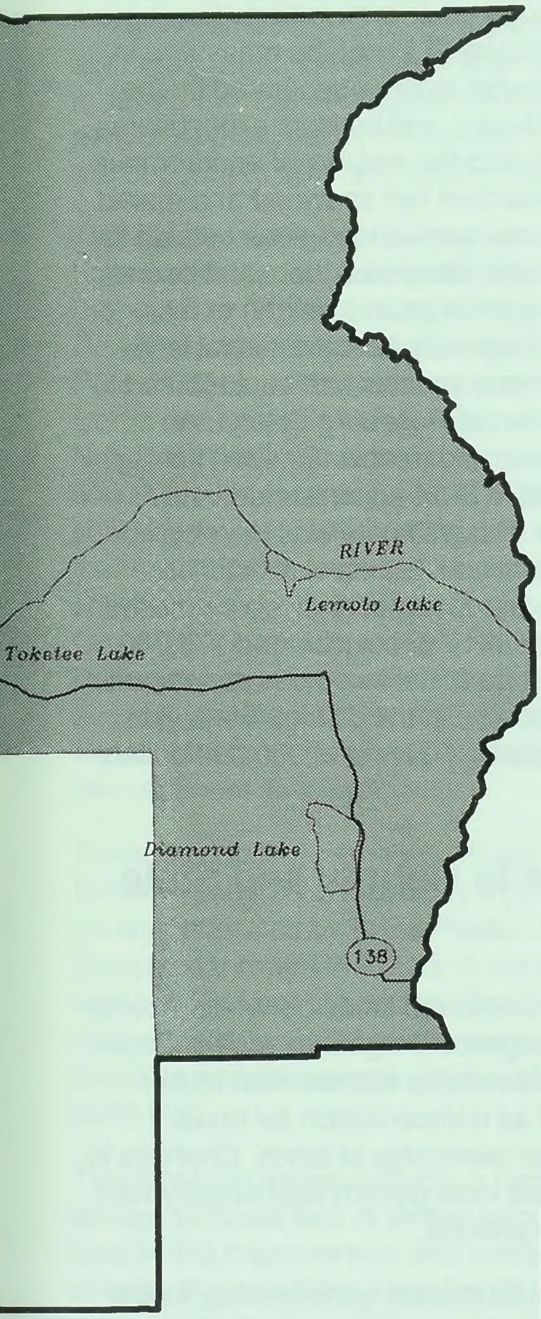
U.S. Department of the Interior
Bureau of Land Management

ROSEBURG DISTRICT
1992 RMP/EIS

DRAFT



LEGEND

- ▼ District Office
- 5 Interstate Highway
- 199 U.S. Highway
- 46 State Highway
- ━ District Boundary
- ─ Highway
- ─ Stream
- Urban Area
- ● City

Minerals Key

Locatable Minerals
- ▇ High Potential
- ▒ Moderate Potential

Geothermal
- ▒ Moderate Potential

Coal
- ▨ Moderate Potential

Oil and Gas
- ◫ High Potential
- ◫ Moderate Potential

MAP 3-11: MINERALS POTENTIAL

BLM Economic Contribution

BLM-administered lands in western Oregon make significant contributions to local economies. Timber harvested from public lands supplies local mills, and commercial and sport fisheries depend upon fish reared in stream reaches managed by BLM. Tourists bring new dollars into local communities, and counties receive payments from BLM in accordance with a variety of current laws. For planning purposes an input-output model (BLM PACT) was developed to facilitate estimation of economic impacts of BLM management on local economies. Models were developed to represent each BLM district and western Oregon as a whole. In the model representing the Roseburg District the portion of Douglas County outside the district was not included.

Timber

The BLM currently manages 367,500 acres of commercial forest land in the Roseburg District. The average annual harvest from this land during 1984-1988 totaled 254,634 mbf, or approximately 27 percent of all harvest from all ownerships in the county. USFS harvests totaled 29 percent of all harvests, and private industrial harvests were 40 percent. The remaining four percent was harvested from State, Other Public, and Non-industrial Private lands. The average annual harvest from BLM-administered lands is estimated to contribute 1,560 jobs in the timber industry and 37.93 million dollars in direct local personal income. Respending effects added 920 jobs in other sectors and 13.60 million dollars in local personal income.

Tourism

As public lands most BLM-administered lands are available for recreational use by the general public. Opportunities exist for site specific and dispersed recreational use. Common activities include: hunting, fishing, driving for please, horseback riding, ORV use, and boating. Community economic impacts occur when visitors from out of the region make purchases in the local economy. These "new" dollars create jobs and enhance personal income. The total level of recreation spending by local residents is assumed not to be directly influenced by the provision of recreation opportunities on BLM-administered lands. BLM estimates that a total of 33,100 annual visits were made to BLM-administered lands in the Roseburg District by non-residents. Four thousand-two hundred hunters and 4,700 fishermen were among these visitors. Input-output analysis suggests that spending by these visitors generated 27 direct jobs and 280,000 dollars in local personal income. Respending effects added 12 jobs and 170,000 dollars in local personal income.

Fisheries

BLM manages 192 miles of stream suitable for spawning and rearing of anadromous fish species in the Roseburg District. Most of the fish spawned and reared in BLM-managed streams are caught offshore or on waters accessed through other ownerships. The value of the fisheries provided by BLM can be measured in terms of jobs and personal income generated by the commercial fishing industry, and by local expenditures by sport fishermen. Due to the mobility of anadromous fish the economic benefits of fish spawned and reared in a specific location may accrue to regions outside the spawning region. An estimated 98.8 thousand pounds of chinook and coho salmon (round weight) or less than one percent of Oregon's total commercial landings of these anadromous species can be attributed to BLM-managed lands in the Roseburg District. An estimated 19,200 ocean and freshwater sport fishing visits can be attributed to BLM-administered lands in the Roseburg District. This estimate was developed independently of recreational fishing visit estimates discussed previously. Input-output analysis estimates statewide employment of 17 direct jobs and 170,000 million dollars of direct personal income is dependent upon the fisheries resource in the district. Statewide respending effects added 11 jobs and 200,000 dollars in personal income.

BLM Payments to County and State Governments

Activities on BLM-administered lands generate income and employment throughout Oregon. In addition, state and local governments receive monies from timber harvest activities and as compensation for taxes foregone due to public ownership of lands. Changes in these payments impact local government employment and the services they provide.

Fifty percent of the total revenue generated by timber sales on O&C lands is distributed to western Oregon counties by a formula based on the original assessed value of O&C lands within each county. Average payments to Douglas county (1984-1988) was $15,768,825. Unlike payments to counties from timber sales in the National Forests, which are required to fund schools and roads, the O&C payments enter directly into the county general fund and can be spent without restriction. In some counties this is a substantial portion of the general fund.

In 1919 Congress revoked title to 93,000 acres from the Coos Bay Wagon Road Company because of its failure to meet the stipulations of the land grant it had received. Today the lands remaining from the original grant are located in Coos (59,914 acres) and Douglas (14,633 acres) counties. The Roseburg District manages 13,924 acres of Coos Bay Wagon Road (CBWR) land. Local taxing districts where these lands are located receive payments in lieu of taxes. Calculation of payments in lieu of taxes is made on the same basis as property tax and severance tax calculations for privately owned forest land. Table 3-43 displays the average distribution of Coos Bay Wagon Road monies to taxing districts in Douglas county during the baseline period. Approximately 75 percent of payments made are dependent upon the level of harvest.

The counties also receive payments in lieu of taxes from the BLM for a variety of federally managed lands (not O&C or CBWR). Along with some BLM Public Domain lands, compensation is paid for National Forests, National Parks, Federal Water Projects, Army Corps of Engineers dredge disposal areas, some National Wildlife Refuges and some military installation. These annual payments of 75 cents per acre, subject to a per capita ceiling, are reduced to a minimum of 10 cents per acre when other revenue sharing activities make equivalent payments. In western Oregon each county receives the minimum payment. During the baseline period Douglas county received an average payment of $91,989. These payments are not expected to change under any foreseeable BLM management strategies.

Roseburg District manages 18,427 acres of Public Domain lands. Approximately 5 percent of the revenues generated by these Public Domain lands are dispersed through the State to the counties based on total land area of the county. The counties must use these monies to build roads and bridges. During the baseline period average payment to the State was $329,905.

The State of Oregon collects a harvest tax on every thousand board feet of timber harvested in the state to fund forest improvement and protection. Forest research, the activities of the Forest Practices Act, and emergency fire control are funded by the revenues collected. Table 3-44 displays the tax rates during the baseline period and to the present biennium. The purchasers of BLM timber pay this tax.

Community Stability

The previous sections detailed economic indicators for the counties in the district during the baseline period. More recent trends were also discussed. The years following the baseline period to the present included a national recession felt locally. These most recent years may indicate the types of social and economic impacts that could be expected if BLM management plans have an adverse impact to local economies.

Employment losses during 1989, 1990, and 1991 occurred in all sectors of Oregon's economy including electronics, wholesale and retail trade, manufacturing and lumber and wood products. Of these industries BLM management is most likely to impact the lumber and wood products sector. Timber sales from national forests and BLM-managed lands in the district have been substantially lower than historic levels since the baseline period. Harvest levels have also declined since the baseline period.

Impacts of these reduced harvest levels are occurring against a background of existing structural change. Examples of ongoing structural change in the lumber and wood products sector include:

- Decreasing labor intensity.
- Increasing use of smaller diameter logs.
- Increased competition and specialization.
- Expansion of international markets for wood products.
- Increased use of substitute building materials.
- Expanded use of Oriented Strand Board (OSB).
- Increased production and use of laminates and engineered wood products.

Lands in the Umpqua National Forests are encompassed within the district boundaries. Roseburg Resources, Weyerhaeuser International Paper and Lone Rock Timber are among the major industrial forest owners in the area. Roseburg Forest Products also operates mills in Dillard, Riddle and Dixonville. Timber dependence in the region, as measured by lumber and wood products employment as a percent of total employment in the region, has been cyclical, increasing in 1983, 1986, 1987, 1990 and decreasing in 1984, 1985, 1988, and 1989. As a portion of personal income, lumber and wood products dependence decreased in 1985 then increased until 1989 when personal income derived in the lumber and wood products industry declined significantly. Employment and personal income are measured on a county basis. These measures have shown increases throughout the baseline period and to the present. Demographic data shows population is becoming more concentrated in the incorporated area of Roseburg. Thus, sources of employment and personal income are also becoming concentrated in these areas. Population in the unincorporated areas of the district has been increasing at a lower rate than Roseburg of the county as a whole. Given this, it is likely that personal income and employment are not increasing in the rural areas of the district and may in fact be decreasing. Communities in these rural areas typically have only one or two large manufacturing employers, usually timber related. Employment options in these communities are severely limited. Options may be further limited in those communities that are located some distance from major trade centers, such as Canyonville, Myrtle Creek, Tri-City and Yoncalla.

Historic level of BLM payments made to the counties in the district are enumerated in a previous section. Payments are not made on a per capita basis, but displaying them as payments per capita allows useful comparisons to be made between counties and indicates a general level of dependence on BLM payments. During the baseline period payments per capita in Douglas county were $171. County dependence on BLM and other sources of federal timber revenue was assessed in Social Impacts of Alternative Timber Harvest Reductions on Federal Lands in O & C Counties (Lee, et al. 1991). Douglas county was examined in the report. In the FY 1989-1990 budget, BLM payments were approximately 36 percent of the total county budget. The county general fund received 74 percent of its revenues from BLM payments to the county. Federal (BLM& USFS) timber revenues were approximately 66 percent of the total county budget.

The counties and communities in the Roseburg district are highly timber dependent. The local county government is also highly dependent upon forest revenues to meet operating expenditures. Current changes in the structure and size of the timber industry are causing substantial economic and social impacts. Social impacts associated with these recent economic dislocations include unemployment, loss of income and increased needs for social services. Out-migration from particularly distressed areas is occurring.

Table 3-43. Average Annual In-lieu Tax Payments On CBWR Lands Administered by the Bureau of Land Management in Douglas County 1984-1988 (1)

Taxing District	Average Annual Severance Tax (2) Receive (1984-88)	Average Annual Property Tax (3) Received (1984-88)	Average Budget Levy Submitted (1984-88)	Avg. CBWR Payments as a Percent of Average Levy (1984-88)
Douglas County	$ 4,128	$ 1,069	$2,823,462	0.184%
Oakland School District 1	$ 372	$ 122	$1,760,969	0.028%
Camas Valley School District 21	$15,683	$ 4,391	$ 477,575	4.203%
Winston-Dillard School District 116	$32,920	$10,559	$3,923,893	1.108%
Douglas Educational Service District	$ 3,381	$ 1,036	$2,751,619	0.163%
Umpqua Community College	$ 3,451	$ 1,135	$2,697,679	0.170%
Roseburg School District 4	$ 0	$ 9	$12,014,112	0.001%

(1)Payments in-lieu of taxes are made to the county treasurer and distributed to tax districts.
(2)Severance tax is 6.5 percent of the value of the timber harvested.
(3)Assessed value of forest land is a function of the price of second-growth Douglas-fir stumpage over the most recent three-year period.
(4)The CBWR lands in the Roseburg School District are not forested with commercial species.

Source: Douglas County Office of Management and Finance.

Table 3-44. Forest Products Harvest Tax (FPHT) Rates Applicable to BLM Timber Purchasers ($/MBF Scribner Long Log)

Period	Forest Practices Act	Forest Research Lab	Emergency Fire Fund	Forest Resources Inst.	Industrial Fire Prev.	Total FPHT Rate
7/1/83-6/30/85	$0.12	$0.23	$0.15	$0.00	$0.00	$0.50
7/1/85-6/30/86	$0.10	$0.21	$0.00	$0.00	$0.00	$0.31
7/1/86-6/30/89	$0.10	$0.21	$0.15	$0.00	$0.00	$0.46
7/1/89-6/30/91	$0.16	$0.21	$0.30	$0.00	$0.00	$0.67
7/1/91-6/30/93	$0.39	$0.30	$0.50	$0.31	$0.14	$1.64

Source: Oregon Department of Revenue. Personal Communication, Rick Schaek. July 1991.

Rural Interface Areas

Rural interface areas (RIA) are areas where administered lands are adjacent to or intermingled with privately owned lands. These lands have been zoned by the western Oregon counties for uses which provide for occupancy where the minimum lot size for residential development is twenty acres or less. In this district, Douglas County has designated rural residential zones which permit single-family dwellings on parcels from 1 to 5 acres. In the resource oriented zones, except Timberland Resources, minimum allowable lot sizes range down to 20 acres. Douglas County zoning does not define parcels between 6-20 acres in size.

The zones oriented toward resource production promote continued sound management practices of agriculture, or forest resource uses. The general intent of these resource zones is to preserve the land from non-resource use and conflicts. However, the zoning ordinance permits single-family dwellings in most resource zones and provide conditions for land partitioning and residential development of private lands. The ordinances may:

a. restrict non-resource uses (e.g., no homes unless necessary for management of forest resources, Douglas County zone Timberland Resources);

b. allow non-resource uses with conditions (e.g., a home placed so it does not interfere with adjacent resource uses);

c. allow a mixture of resource and non-resource uses.

These provisions are intended to reduce the possibility of conflicts between residential uses and resource management activities.

In some situations residential uses on private land and intensive forest management activities on adjacent or nearby BLM-administered lands have created conflicts. Due to adverse effects on both interests, these conflicts are being addressed in BLM land use planning. To accomplish this, the areas where rural residential land use is permitted to occur near BLM-administered lands, have been mapped (see Rural Interface Area Map 3-12).

Rural interface areas include areas of private and BLM-administered land within 1/2 mile of the property or interface line. The 1/2-mile distance was selected as a probable zone of influence. The analysis of impacts in Chapter 4 will also examine a 1/4-mile zone of influence within the RIAs. Although problems have occurred where lots are larger than 20 acres, these larger-lot areas will not be analyzed.

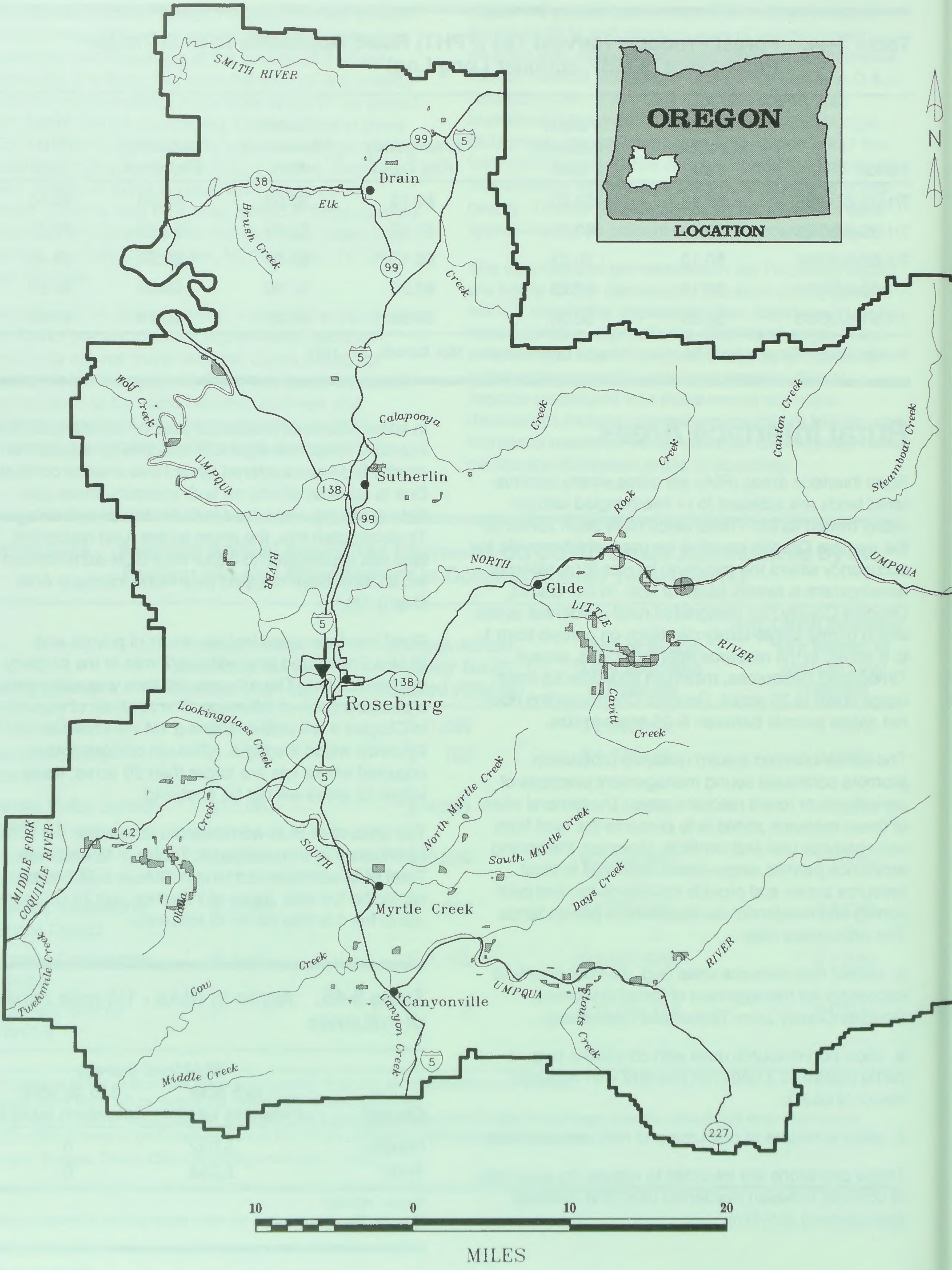
The amount of BLM-administered land within the zones of influence is summarized in Tables 3-45 and 3-46. Total BLM-administered land in RIAs is 8,552 acres within the 1/4-mile zones of influence and 24,052 acres within the 1/2-mile zones of influence.

Table 3-45. Acres in RIAs - 1/4-mile zones of influence

	BLM land (acres)	
County	1 to 5 acre minimum lot RIA	6 to 20 acre[1] minimum lot RIA
Douglas	8,552	0
Total	**8,552**	**0**

Source: WODDB

[1] Douglas County zoning does not define panels between 6-20 acres in size.



OREGON
LOCATION
N
SMITH RIVER
99
5
38
Drain
Elk
Brush Creek
99
Creek
5
Wolf Creek
Calapooya
Creek
UMPQUA
Sutherlin
138
99
Canton Creek
Steamboat Creek
Rock Creek
NORTH
UMPQUA
RIVER
Glide
LITTLE
RIVER
5
138
Roseburg
Cavitt Creek
Lookingglass Creek
5
North Myrtle Creek
South Myrtle Creek
42
Creek
SOUTH
MIDDLE FORK COQUILLE RIVER
Olalla
Myrtle Creek
Days Creek
Twelvemile Creek
Creek
Cow
RIVER
UMPQUA
Canyonville
Canyon Creek
Shouts Creek
5
Middle Creek
227
10
0
10
20
MILES

U.S. Department of the Interior
Bureau of Land Management

ROSEBURG DISTRICT
1992 RMP/EIS

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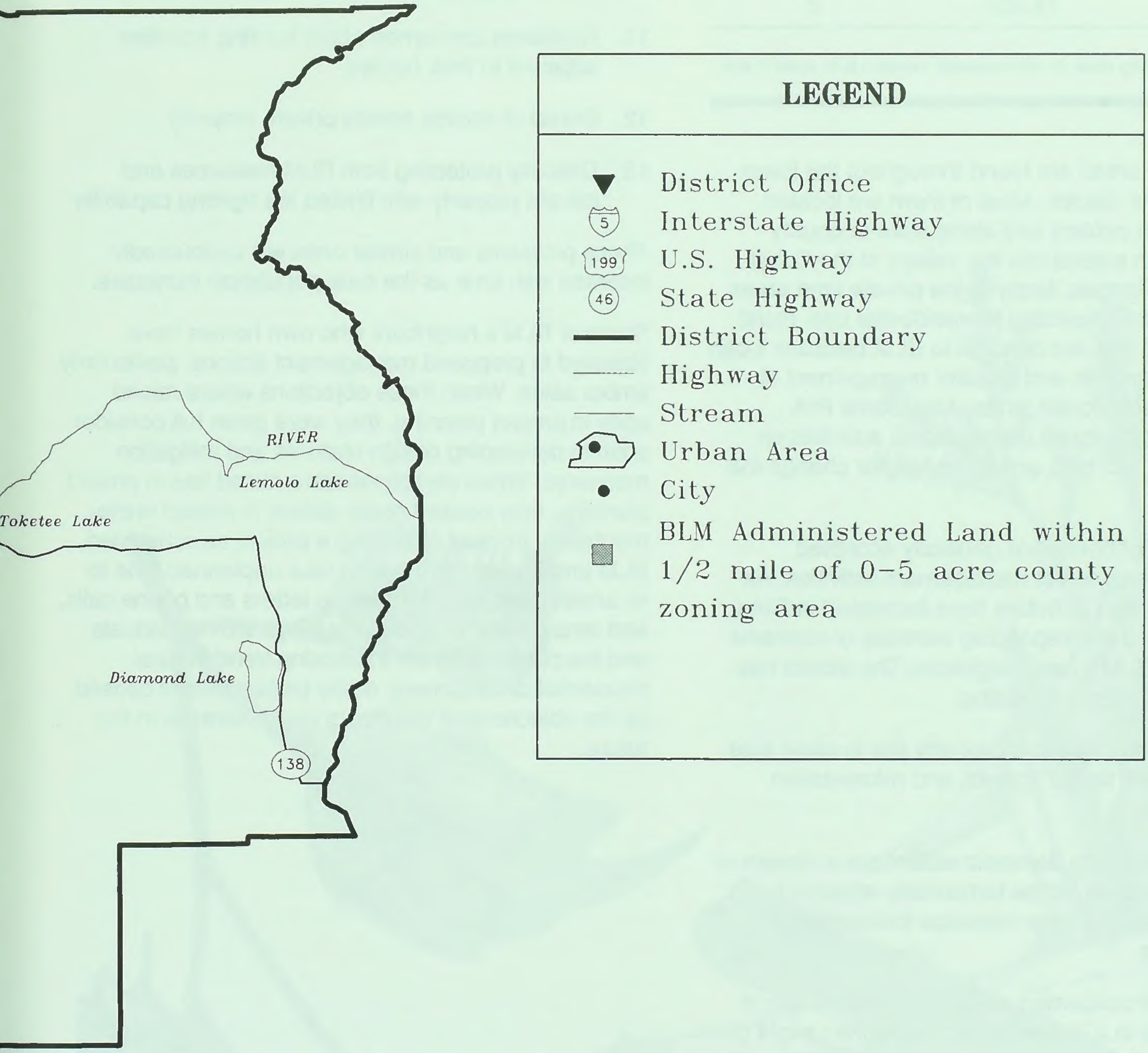


MAP 3-12: RURAL INTERFACE AREAS

Table 3-46. Acres in RIAs - 1/2-mile zones of influence

	BLM land (acres)	
County	1 to 5 acre minimum lot RIA	6 to 20 acre[1] minimum lot RIA
Douglas	24,052	0
Total	**24,052**	**0**

Source: WODDB

[1]Douglas County zoning does not define parcels between 6-20 acres in size.

Rural interface areas are found throughout the lower elevations of the district. Most of them are located near population centers and along state or county highways which extend into the valleys of the Coast and Cascade Ranges. Many of the private land areas in RIAs are highly desirable for residential use. Rural residential land use is a concern to BLM because it can impede the economic and efficient management of BLM-administered forest lands. Also, some RIA residents object to forest management activities on adjacent lands and take actions to stop or change the activity.

BLM's rural neighbors have generally accepted adjacent or nearby forest management activities. As forest management activities have increased in RIAs, there has been a corresponding increase of concerns expressed by BLM's rural neighbors. The district has experienced problems including:

1. A house too close to a property line to allow safe and efficient timber harvest and reforestation operations.
2. A resident taking domestic water from a stream or spring which would be temporarily affected by road building or other resource management operations.
3. Neighbors concerned about the potential use of herbicides in a watershed and how they might be impacted.
4. Logging road maintenance levels do not meet expectations of neighbors.
5. A resident objecting to a clearcut within immediate view of the home.
6. Possible health and safety problem due to nearby slash burning.
7. Residents opposed to any harvesting of timber close to their homes.
8. Neighbors complaining about the noise and dust from a logging operation.
9. Families worried about the safety of small children as it relates to log truck traffic.
10. A house is inadvertently in trespass as it was unknowingly built on public land.
11. Residents concerned about hunting activities adjacent to their homes.
12. Denial of access across private property.
13. Difficulty protecting both BLM resources and private property with limited fire fighting capability.

These problems and similar ones will undoubtedly increase with time as the rural population increases.

Some of BLM's neighbors who own homes have objected to proposed management actions, particularly timber sales. When these objections where raised early in project planning, they were given full consideration in developing design features and mitigation measures. When objections were raised late in project planning, they caused costly delays in project implementation. Instead of starting a project as scheduled, BLM employees have had to take unplanned time to re-analyze projects, respond to letters and phone calls, and arrange and/or attend meetings with individuals and the public. With the increasing trend in rural residential development, costly project delays caused by the objections of neighbors could increase in the future.

Chapter 4
Environmental Consequences

Introduction

In this chapter, environmental consequences (impacts) of implementing the alternatives described in Chapter 2 are defined and compared to the existing conditions and affected environment described in Chapter 3. A tabular comparison of impacts of the alternatives is shown in the RMP/EIS Summary (Table S-2).

Preliminary analysis, including scoping, indicates that the alternatives would not significantly impact the following: geology, topography, grazing, agriculture, prime and unique farmlands, floodplains, paleontological values, or renewable energy (i.e., wind, hydro, biomass) use. Therefore, these topics are not discussed in this chapter.

Direct, indirect, and cumulative effects are all considered, to the extent identifiable, in each analysis. Direct effects are caused by the action and occur at the same time and place. Direct effects result from activities planned or authorized by the BLM under each alternative. Indirect effects are caused by the action and occur later in time or are farther removed in distance, but are still reasonably foreseeable. Indirect effects generally occur when the public takes advantage of opportunities provided by BLM management. Hunting, fishing, and other recreational activity are examples, as are the effects on socioeconomic conditions. Cumulative effects are those resulting from past, present, and reasonably foreseeable activities on BLM-administered lands and on other lands, both other public and private.

There are three topics that the National Environmental Policy Act requires Environmental Impact Statements (EIS) to address in relationship to the proposed action, which EISs often treat as separate topics:

- Relationship between short-term uses and long-term productivity.
- Irreversible or irretrievable commitments of resources.
- Adverse environmental effects which cannot be avoided.

These topics are addressed, where relevant, as part of the discussion of environmental consequences for each component of the environment.

The baseline period to which predicted future effects are compared is normally 1984-1988, the period for which the existing plan has been in effect and for which a wide range of relevant baseline data have been gathered and/or published. The baseline period for specific resources are noted in the appropriate section.

Both short and long term time frames were considered. Short term is the period of time during which the plan will be implemented, assumed to be 10 years. Short term impacts include those resulting from harvest of timber sold during the 10-year period, even though such a harvest may occur two or three years after sale. Long term is the period beyond 10 years. Long term impacts were not analyzed in detail whenever meaningful analysis depended on specificity provided by the 10-year timber management scenario, nor for many cumulative effects that are primarily dependent on (forecasting) activities on private lands (e.g., effects on water and elk).

Knowledge about the physical, biological, and socioeconomic relationships discussed in this chapter is not complete. Much remains to be learned about the ecology and management of forests. Resource inventories are costly and those completed so far fall short of the ideal for every resource. The relationships between resource supply and the economy and communities are also imperfectly defined.

The interdisciplinary planning team evaluated that information in light of council on Environmental Quality Regulations on incomplete or unavailable information. The planning team sometimes concluded that missing information would improve their estimates. However, the basic data are sufficient and the relationships are well enough established to allow a reasoned choice among the alternatives.

A number of analytical models have been used to assess effects of the alternatives on various components of the environment. These models, like all models of complex biological-physical or economic systems necessarily simplify reality. They also are limited by current knowledge, but represent a synthesis of the knowledge of BLM staff and/or outside scientists familiar with the subjects of concern.

Model evaluation involves extensive validation through testing and comparison of predictions with actual outcomes. In that sense, most of the models used are too new to be validated. In fact, such validation of most of these models would take decades. Nonetheless they provide the most useful available methods, other than analyst intuition, for comparing probable differences in outcomes from implementation of the various plan alternatives. Model outputs are acknowledged not to be absolutes.

The application of the models to alternative C, the connectivity areas, and old-growth emphasis areas (OGEA) of the Preferred alternative (PA), and other analyses of effects of that alternative, are attended by a lower level of confidence than the analyses of other alternatives. This circumstance is due to the substantially untested nature of some of the prescriptions associated with these alternatives.

In addition to a full analyses of the consequences of the seven land-use allocation alternatives, BLM has conducted some sensitivity analyses of the effects of varying management approaches. Sensitivity analysis is a process of identifying opportunity costs associated with differing approaches to sensitive land-use allocations and other decisions. It can assist selection of a preferred alternative by examining specific trade-offs which could result from making changes in single sensitive elements of an alternative.

Sensitivity analyses were conducted of potential allocations for cavity nesters, riparian zone protection, and old-growth and mature forest protection or partial retention. In addition, sensitivity analyses were conducted of certain variations in the timber management prescriptions for the preferred alternative and alternative A. These analyses are discussed in Appendix 4-1.

The following assumptions were used as a basis for analysis of impacts:

- Sufficient funding and personnel would be available for implementation of the final decision.
- The alternatives would be continued for many decades.
- Standard design features described in chapter 2 will be applied as described. They contain many of the mitigating measures that avoid, minimize, reduce, or eliminate potential environmental impacts.
- Local climate patterns of historic record (See Appendix 4-2 for further discussion) and related conditions for plant growth will continue.
- During the 10-year life of the plan, approximately 60 miles of new roads would be constructed across BLM-administered lands by private parties under the terms of existing reciprocal right-of-way agreements.
- For analysis of cumulative effects, most private forest lands would be intensively managed with final harvest on commercial economic rotations averaging 50 years.

A 10 year representative timber management scenario has been developed based on the land use allocations for each alternative except the No Action alternative, and used to assess potential short-term site-specific impacts. The scenarios represent the resource area staffs' assumptions as to possible locations of timber harvest units and roads. A total harvest scenario (harvest units and roads) was built for the land that would be available for timber harvest in alternative A. This scenario was then adjusted to the land available for timber harvest in each other alternative. The 10 year scenario for the preferred alternative was adjusted to mitigate unrealistic impacts on water quality from localized clustering of assumed timber sale units. Similar adjustments were made to the common alternatives during the selection/deselection process, when possible, but not to the degree that was done for the preferred alternative.

For each alternative, random spatial selection of timber harvest units was linked to the TRIM-PLUS allowable sale quantity "run", to determine the 10year scenario which meets management selection criteria to provide the calculated allowable sale quantity identified for the alternative. The selected scenarios were evaluated for practicality by resource area timber sale planners. Estimates of logging practices, average annual levels of associated activities, and intensive management practices for the decade of the plan are displayed in Table 4-1. In borderline cases, the estimates assume the practice which results in greatest impact.

Due to unforeseeable events and adjustments made in site-specific planning, actual timber sale and management plans will differ from the 10 year scenarios. The scenarios provide an analytical tool, however, to help provide more specificity to analysis of impacts of the alternatives. Actions (such as timber sales) implementing the planning decisions will be analyzed before implementation to determine if impacts addressed in the EIS (e.g., impacts to water quality in the analytical watersheds) might differ significantly from those predicted based on the 10 year scenarios. For analysis purposes, it was assumed that all harvest units in any watershed may be logged within any fiveyear period.

Ten-year scenarios of expected mineral exploration and development activity have also been developed. They are set forth in Appendix 4-3.

Analysis of the alternatives is also based on their different levels of planned activities as shown in Table 2-1.

Mitigation

Mitigation is important in the design of the alternatives and implementation of any alternative. In general, mitigation is a measure taken to cause an action to become less harsh or less severe. From the CEQ Regulations (40 CFR 1508.20), "mitigation" includes:

1. Avoiding the impact altogether by not taking a certain action or parts of an action;

Table 4-1 Estimated Annual First Decade Levels of Timber Management Activity by Alternative.

Activity (acres except as noted)	NA	A	B	C	D	E	PA
Regeneration Harvest	5,700	7,400	6,660	3,240	1,890	670	3,220
Woodlands Harvest	0	60	50	10	0	0	0
Road Construction (Miles)	50	50	45	19	19	3.5	21.5
Road Construction (Acres)	273	273	246	104	104	19	117
Commercial Thinning/Density Mgmt.	140/0	170/0	160/0	430/110	100/0	10/0	510/130
Ground-Based Yarding	170	230	220	120	70	20	100
Cable Yarding, No Suspension	1,220	1,520	1,450	700	400	140	690
Cable Yarding, Partial Suspension	3,980	5,140	4,600	2,240	1,340	470	2,240
Cable/Aerial Yarding, Full Suspension	330	510	390	180	80	40	190
Site Preparation:							
Prescribed Burning	3,000	3,000	3,000	2,430	1,420	5,770	2,420
Other	400	370	330	160	70	30	160
Release/Pre-Commercial Thinning	4,040	5,700	5,490	4,400	3,280	800	5,280
Brushfield/Hardwood Conversion	0	60	50	40	30	10	50
Planting/Regular Stock	5,230	5,410	4,520	1,940	930	160	970
Planting/Genetically Selected Stock	1,520	3,470	3,470	1,940	1,330	640	2,900
Fertilization	5,560	6,230	4,460	2,170	930	450	2,160
Maintenance/Protection	7,080	4,960	4,460	2,170	930	450	2,160
Underburning for Maintenance of Stand Structure	0	0	0	500	0	0	500

2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation;

3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;

4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and

5. Compensating for the impact by replacing or providing substitute resources or environments.

In the design of alternatives and throughout the discussion of environmental consequences in this chapter, mitigating measures and Best Management Practices (BMP) have been incorporated and evaluated. For the actions analyzed in this plan/EIS, mitigating measures are addressed primarily through land allocations and management practices and standards as described in Chapter 2.

Some examples of such mitigating measures and BMPs built into the design of alternatives and identified in Chapter 2 are:

Cattails—Red Pond ACEC

- Selection of timber harvesting techniques and timing to minimize soil damage.
- Design and timing of prescribed burns to minimize effects on soils, wildlife habitat, and air quality.
- Wildlife tree retention.
- Elk forage seeding.
- Seeding exposed soil after road construction.
- Tilling compacted skid roads.

Effects on Global Climate

There is a large but not unanimous body of scientific opinion that anticipates global warming in the magnitude of several degrees Fahrenheit by the middle of the 21st century. The primary factors leading to this conclusion are substantial increases in atmospheric carbon dioxide, nitrous oxide, methane, and other trace gases attributed to human activity. BLM's land management activities in the planning area would affect primarily the amount of carbon dioxide. Forecasts of global carbon dioxide increases suggest that it may double from the level of present in the year 1900 sometime between the years 2030 and 2080 (Schneider 1989). The plan alternatives, however, would have only a slight effect on atmospheric carbon dioxide levels.

A key factor in assessing the impact of timber harvest and forest regrowth on the amount of carbon in the atmosphere is the amount of carbon stored within the trees of the forest. One analysis shows that forests managed on rotations of less than 100 years would store less than half the amount of carbon stored in old-growth stands (Harmon et al. 1990), leaving more carbon in the atmosphere. Analysis by Harmon et al. indicated that about 42 percent of timber harvested in the northwestern U.S. enters long-term storage in products, while paper production largely results in the loss of carbon dioxide to the atmosphere. Commentors on the analysis by Harmon et al. have suggested that some factors relevant to assessing the impact of timber harvest levels in the Pacific Northwest on global climate were apparently not considered in this analysis, so it overstates the effect of timber harvest. These factors include: (1) the slow decomposition of products entering landfills, (2) possible emissions increases if fossil fuels are burned in lieu of wood or wood products, and (3) emissions associated with substitution of alternative construction materials for wood or substitution of wood from virgin forests outside the northwestern U.S.

The calculations of Harmon et al. indicate that each million acres of old-growth forest harvested in the northwestern U.S. would add less than one-tenth of one percent to the total carbon currently in the atmosphere. The largest acreage of old-growth (age class 200+) proposed for harvest for the 10year life of the plan in any plan alternative is 75,583 acres in alternative A, while the preferred alternative would harvest 14,700 acres of old-growth. Although they store less carbon in total, young, fast-growing trees absorb more carbon from the atmosphere than older trees. Fertilization, vegetation management, and planting genetically selected stock all enhance this effect. In mature and old-growth stands, release and absorption of carbon dioxide tend to be in balance. But logging, especially clear cutting, increases the rate of decomposition of debris on the forest floor, releasing more carbon dioxide. Not until a young stand reaches the stage of canopy closure does its carbon uptake offset that release (Alaback 1989).

One forest practice directly contributing carbon dioxide to the atmosphere is prescribed burning after timber harvest. In the absence of burning, however, the decay of the same wood over many years would contribute a similar amount of carbon dioxide. The largest amount of slash burning anticipated in any alternative (alternative C and PA) is approximately 80,100 tons per year (see Effects on Air Quality discussion), while the least amount of slash burning under any alternative (alternative E) is approximately 10,800 tons per year. These levels of burning would contribute a maximum of 120,150 tons per year and 16,200 tons of carbon dioxide to the atmosphere, respectively. (Burning a ton of slash can create up to 1 1/2 tons of carbon dioxide as the released carbon combines with oxygen.) In the long term, a managed forest will be in balance with its release and absorption of carbon dioxide, just as is an unmanaged forest. Given that half of newly released carbon dioxide would remain in the atmosphere (Schneider 1989), a decade of harvest of some of the older forest and prescribed burning under the preferred alternative could add 0.0008 percent to the carbon in the world's atmosphere, an unavoidable adverse impact.

The cumulative effects of BLM activities under the preferred alternative, and similar activities proposed or anticipated on other forest lands in western Oregon and Washington for the expected 10 year life of the RMP, would add an estimated 180 million tons of carbon dioxide to the world's atmosphere, increasing carbon there by 0.02 percent. This includes some 130 million tons from old-growth timber harvest indicated by preferred alternatives in other BLM draft RMPs for western Oregon and by the U.S. Forest Service preferred alternative in their Final EIS, Management Direction on Northern Spotted Owls (1992), and 40 million tons from prescribed forest management burning by all landowners as controlled by the ceilings established in the Oregon Smoke Management Plan and the Washington State Smoke Management Plan. The effect on global climate would be slight. Total increases in atmospheric carbon dioxide from all worldwide sources, by comparison, are occurring at a rate of almost one-half percent annually.

Effects on Air Quality

The major sources of air pollutants associated with BLM resource management activities are smoke from prescribed burning, application of herbicides used to control unwanted vegetation, dust from use of unsurfaced roads, and road construction and maintenance.

The impacts associated with herbicide use can be found in the Record of Decision for Western Oregon-Management of Competing Vegetation to which this EIS is tiered (see Appendix 1-4).

Dust from new road construction and maintenance of older unpaved roads normally settles within a short distance from the point of origin. It has a negligible impact away from the construction and maintenance sites. Dust associated with road use also has negligible impact away from unpaved roads.

Prescribed burning is the only resource management activity proposed under any alternative that could have a notable adverse impact on local or regional air quality. Smoke from prescribed burning adversely affects visibility. At the point of ignition, it can be in such a concentration that continuous exposure can lead to upper respiratory health impacts.

Under all alternatives, prescribed burning activities, regardless of the resource management objectives, would follow the guidelines established by the Oregon Smoke Management Plan (OSMP) and the Visibility Protection Plan. At times, it would be necessary to use methods other than prescribed burning to meet management objectives because there is insufficient airshed capacity on a day-to-day basis for burning in and adjacent to non-attainment areas to accommodate planned prescribed burns.

In order to comply with the OSMP, use of alternative treatment methods to broadcast burning would be part of all alternatives. Use of these techniques would be applied to the area directly adjacent to any designated nonattainment area and major transportation corridors. Therefore, under all alternatives biomass consumption is expected to be less than the 1984-88 average consumption levels. Under alternatives D and E it would be relatively easy to reduce emission from forestry burning by 50 percent by the year 2000, in accordance with the OSMP goal, due to reductions in total harvest levels, higher utilization standards for all woody debris during and after harvest, and the need to retain coarse woody debris on site to meet wildlife, biological diversity, and site productivity requirements. However, it may be necessary to reduce the fuels consumption identified in Figure 4-1 for alternatives NA, A, and B by approximately 15 percent and for alternatives C and PA by approximately 35 percent in order to meet the 50 percent reduction by the year 2000.

Current control strategies for particulate matter (PM) emissions have been very successful in reducing total emissions from prescribed burning in western Oregon. Therefore, visibility impacts on Class I areas have been reduced. It is anticipated that intrusions into the non-attainment areas from BLM management activities will occur only because of unpredicted weather changes. These intrusions should be few in number, minor in concentration, and of short duration.

Biomass consumption from BLM prescribed burning would be the highest under alternative A and lowest under alternative E. Alternatives C and PA reflect an increase in the use of prescribed burning to accomplish resource management objectives for wildlife habitat and ecosystem health improvement or maintenance, and increasing biological diversity.

Total biomass consumption, using underburning techniques (i.e. burning under standing trees) for alternatives C and PA would be 25 percent less than that associated with broadcast burning of clearcuts under alternative NA, A, B, D, and E. Reductions in total biomass consumption per acre could range from 25 percent under alternative A to 15 percent under alternative C and PA. Reductions in overall total biomass consumption could range from 40 percent under alternative A to 80 percent under alternative E compared to the baseline period. Prohibiting prescribed burning in the rural interface areas under alternatives D and E would reduce local adverse visibility impacts.

Air quality impacts for alternatives NA, A, B, D, and E are based predominantly on broadcast burning under springlike conditions. Impacts under alternative C and PA would involve a combination of underburning (burning harvest units that have retained live trees), under springlike conditions and pile burning during winter conditions. Impacts from pile burning would be local in nature and burning would occur during optimum meteorological and air quality conditions.

Figure 4-1 graghically displays the effects of various alternatives on total tons of biomass consumed by prescribed burning for timber management and other resource management uses of prescribe fire.

The availability of residual wood from timber harvest activities on BLM-administered lands for sale as firewood would be substantially less under alternatives C, D, E, and PA compared to alternatives NA, A, and B. Firewood availability will continue to decline under all alternatves due to increased utilization of wood waste by contractors and a decrease in the physical removal of the waste material in support of other resource management objectives.

Conclusion

Air quality, under all alternatives, would not deteriorate to a point that ambient air quality would be adversely impacted due to prescribed fire. Particulate emissions from prescribed fire has not been shown to be a major contributor to any non-attainment areas problem. Under all alternatives air quality impacts associated with BLM-administered activities are normally of very short duration and would have no long or short term impacts on regional air quality.

Due to meteorological conditions, the allocation of burning authorizations under the OSMP has been insufficient to accomodate all prescribed burning proposed by timberland owners within the planning area and its related airsheds. Thus, under alternatives C, D, E, and PA, for which BLM burn acreage is expected to be less than 1984-1988 average acres, burning by other landowners may increase while maintaining the emission requirements mandated by the state implementation plan (visibility section) and supported by the OSMP. Thus, cummulative prescribed burning on all lands under any alternative would cause no deterioration of ambient air quality.

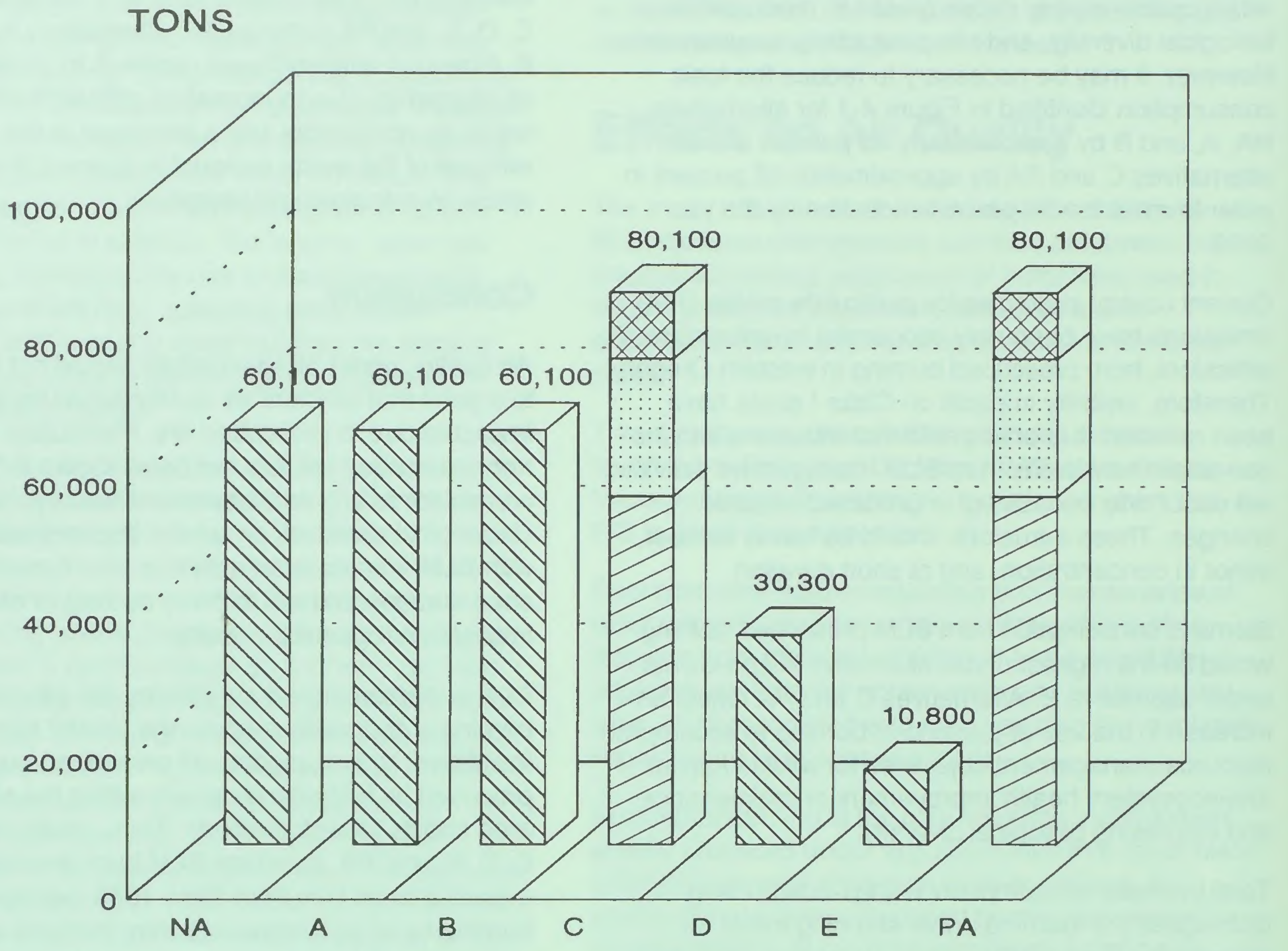
Effects on Soils

Introduction

Long-term soil productivity is the capability of soil to sustain inherent, natural growth potential of plants and plant communities over time. Most forest uses ultimately depend on a productive soil resource. Maintenance of long-term soil productivity is widely recognized as a basic requirement of forest management. The extent to which long-term soil productivity is affected by management activities is not precisely known because investigations of these effects have only recently begun. However, it is known that forest

Fig. 4-1. ANNUAL PRESCRIBED FIRE FUELS CONSUMPTION BY ALTERNATIVE

Roseburg District Bureau of Land Management



	NA	A	B	C	D	E	PA
ECOSYSTEM	0	0	0	9,600	0	0	9,600
BROADCAST	60,100	60,100	60,100	0	30,300	10,800	0
PILES	0	0	0	20,000	0	0	20,000
UNDERBURN	0	0	0	50,500	0	0	50,500
TOTAL	60,100	60,100	60,100	80,100	30,300	10,800	80,100

ALTERNATIVE

▨ UNDERBURN ⬚ PILES ▧ BROADCAST ▩ ECOSYSTEM

Each type of prescribed fire (ie. pile, broadcast, underburn, and ecosystem burn) has a different consumption rate. The total tons consumed is derived from the consumption rate (tons of biomass consumed/acre) multiplied by the acres involved in the type of treatment.

The No Action Alternative (NA) consumption rate is equal to the 1984-88 period. It represents the period when Oregon had realized the largest reduction in total emissions from the 1976-79 levels referenced in Chapter 3.

management practices have the potential to reduce natural productivity if certain operating guidelines are not followed. Implementation of the management prescriptions (Chapter 2) and Best Management Practices (BMP) in Appendix 2-1 would prevent unacceptable degradation of the soil resource. Monitoring and incorporating the latest information will determine whether the prescriptions and BMPs are effective and being correctly applied.

Both soil and non-soil factors influence soil productivity. Non-soil factors, such as climate and geology, are not influenced by forest management activities. Soil factors which can be modified by management activities are soil moisture, soil aeration, organic matter and nutrient availability and soil biology. The district's soils differ in their degree of sensitivity to disturbances. Determining the suitability of specific soils for management practices is an important first step in preventing or minimizing soils related adverse impacts.

The Timber Productivity Capability Classification Inventory (TPCC) identifies fragile sites that are judged to be incapable of supporting a sustained yield of forest products (fragile, nonsuitable woodland classification). No planned timber harvest would take place on these lands under any of the alternatives. Also identified are sites that are subject to unacceptable soil productivity loss as a result of management activities unless special restrictive or mitigation measures are used to protect them (fragile suitable, restricted classification). Table 4-2 lists acres of fragile classifications harvested by alternative.

There is very little difference among alternatives in acreage of TPCC Fragile, Nonsuitable Woodland classification harvested because this is not part of the timber base in any alternative. Alternative A would harvest the most acres of soils classified as Fragile Suitable, Restricted. Alternative E would harvest the least acreage in the soils classified as fragile because no fragile gradient areas would be subject to planned harvest under this alternative.

Forest management practices (including road construction), mining, recreation, and ORV use may affect soil properties and productivity. Some kinds and degrees of disturbances created by forest management practices are considered acceptable while others are detrimental to long-term soil productivity. The extent of soil disturbance depends on numerous factors. Soil type and condition, harvest method, site preparation method, topography, complete implementation of planned practices and mitigation measures, and skills of individual equipment operators will contribute to the degree of disturbance and resultant effects. Detrimental impacts can be avoided, minimized, or ameliorated, and long-term productivity can be maintained if adequate soil management practices are planned and implemented. The most common types of disturbances affecting soils and associated long-term productivity are displacement/compaction, erosion (surface erosion and mass wasting), alteration of nutrient status and changes in soil biology. A summary of effects of the alternatives on these three disturbance types and on long-term soil productivity are discussed in this section. Appendix 4-4 contains more detail and discussion on each of these disturbance types.

Impacts to Long Term Productivity

Adverse effects on long-term soil productivity should be somewhat similar and minimal for all alternatives with successful implementation of BMPs (Appendix 2-1) and practices listed in "Management Direction Common To All Alternatives" (Chapter 2). The major variable between alternatives is the amount of acres affected by management activities. Some researchers suggest that productivity, even on Suitable Commercial Forest Land (SCFL) sites may not be sustainable over the long term under an intensive management regime such as that proposed for alternatives NA, A, B, and the intensively managed forest acres under alternative D and E. Soil fertility may be diminished over time by repeated cycles of harvest, site preparation, and control of competing vegetation (Perry and Maghembe 1989). Alternative C and the preferred alternative would have the least long term adverse impacts to productivity due to the less intensive forest management practices. Under these alternatives, less biomass is removed from the site through retention of conifers, hardwoods, snags, and down woody material. In

Table 4-2. Acres of TPCC Classification Fragile Suitable Restricted Forest Lands Harvested by Alternative [1]

Alternative:	NA	A	B	C	D	E	PA
Acres:	21,800	28,300	25,500	12,400	7,200	1,100	12,300

[1] The acreage of fragile suitable lands to be harvested were derived by multiplying the percentage of fragile lands in the timber base by the proposed acreage to be harvested by alternative.

addition, alternative C and the preferred alternative would generally use less intense prescribed fire under the shelterwood or retention prescription, less vegetation control, and longer rotations. It is assumed that timber harvest would occur proportionally on all soil types regardless of alternative, except alternative E which proposes removing areas classified as "fragile gradient, restricted" from the timber producing land base. A major difference between alternatives is the total acres harvested and the acres of fragile sites which will be included.

Alternative A, with the most acres of harvest and site prepareation, would have the most acres requiring implementation of management practices that would maintain long-term productivity; alternative E would require implementation on the least amount of acres (see Table 4-1). Monitoring for this district during the past five years indicates that standards for soil productivity were met on approximately 80 percent of the units sampled. At times standards were not met because of prescribed fire intensity and soil compaction. If this trend continues, alternative A would have the greatest risk of potential impact on soil productivity due to operational difficulty in implementing practices necessary to maintain that productivity. Conversely, alternative E would have the least risk of reducing long term productivity. Although management prescriptions and mitigation and amelioration measures have been designed to keep the extent and duration of adverse effects on soils within acceptable levels, the adverse effects cannot be completely eliminated. The construction of rocked and/or excavated roads, quarries, developed recreation sites, and water impoundments are irreversible or irretrievable commitments of the soil resource because of the long time needed to revert to natural conditions.

Compaction/Displacement

Research literature reports data for growth effects created by detrimental soil compaction and displacement as a combined effect. The growth effect of each is not separable. Detrimental soil compaction is assumed to occur at depths greater than two inches and is evidenced by an increase in soil density of 15 or more percent (USFS standard in Forest Service Manual Supplement 45, Section 2520.4) over the undisturbed level. Soil compaction can occur on all soils. The majority of increase in density occurs after the first machine pass when soils are wet and after the first three to five passes when soils are relatively dry (Froehlich and McNabb, 1983; Steinbrenner, 1955). Wert and Thomas (1981) reported Douglas-fir growth loss of 43 percent on ground-based yarding skid trails and immediately adjacent (3 meters) areas that were 32 years old. Vanderheyden (1980) found no apparent compaction recovery after 38 years on a variety of soil textures in the Western Cascades of Oregon. Dyrness (1967) and Ruth (1967) reported soil disturbance created by highlead and skyline cable yarding, but tree growth impacts from cable yarding are inconclusive.

Timber harvest and site preparation methods together with soil conditions during operation influence the degree of soil compaction and displacement. Analysis in the ten year scenario indicates that in all of the alternatives, the majority (76 percent) of the district would be harvested with a cable system with at least one-end suspension. Cable systems with full suspension would be used on 7 percent, no suspension would be used on 21 percent, and ground based systems would be used on the remaining 3 percent. Mechanical site preparation would be scheduled for a high of approximately 2300 acres for alternative A to a low of approximately 200 acres for alternative E.

Yarding and site preparation methods would be determined on a unit by unit basis. On slopes exceeding 35 percent, adverse impacts to soils would be reduced or avoided by the use of cable yarding systems. On those sites where ground-based yarding and/or mechanical site preparation are used, implementation and amelioration practices would have insignificant (less than one percent) growth loss effect (see Management Direction Common To All Alternatives section of Chapter 2). When ground-based yarding and mechanical site preparation are used on the same site, the combined growth loss due to compaction/displacement would be less than one percent. Since all management practices would be planned and implemented to avoid detrimental compaction/displacement for all alternatives, there would be insignificant (less than one percent) adverse growth impacts for any of the alternatives. However, alternatives with more acres of ground-based yarding and mechanical site preparation (see Table 4-1) have a greater potential to create adverse impacts from compaction/displacement.

Differences in the number of acres harvested and/or site prepared with ground based equipment among the alternatives are the most direct indicator of potential compaction and associated adverse growth impacts. The most acres (2300) of ground-based yarding and mechanical site preparation would occur in alternative A and decline to a low of 200 acres under alternative E (see Table 4-1).

Erosion and Mass Wasting (Landsliding)

Soil is an anchoring medium for plants and a reservoir of readily available water and nutrients for plant growth. Natural surface erosion rates in undisturbed forested areas of Western Oregon are very low. Overland flow of water is rare due to the usually thick protective cover of vegetation, duff and litter, and the high infiltration rate of the soils. In general, any soil loss is considered to have a negative effect on long term soil productivity as soil nutrients, water supplying capacity, rooting depth, and lateral rooting are reduced. Alternative C and the preferred alternative which propose the retention of live conifers and hardwoods along with extended rotations, compared to alternatives NA, A, B, D, and E, on all harvest units would have the least long term negative impact to soil nutrients, water supplying capacity, rooting depth, and lateral rooting. No conclusive productivity analysis is possible due to lack of data relating surface erosion to forest soil productivity. Topsoil removal will negatively affect productivity.

Forest management activities can accelerate surface erosion processes by creating more exposed and/or compacted soil. Compacted soils cannot absorb water fast enough during heavy rains to prevent runoff. Overland flow of water can cause rills and gullies. Eroded soil may move only a short distance and be redeposited "on-site," with minimal effect on long-term soil productivity. If the erosive force is great enough, it may be carried "off-site" and into streams as sediment.

Forest management activities that are more likely to cause the most soil disturbance, and thus create the greatest potential for increased erosion, are road and landing construction, log yarding, machine piling and scarification, and broadcast burning. However, "Management Direction Common To All Alternatives" (Chapter 2) and BMPs (Appendix 2-1) provide practices which would prevent or minimize compaction and bare soil exposure and related erosion.

Landslides (natural and human caused) affect less than two percent of the district's land base, but may cause off-site effects. They can have significant impacts on water quality, fish habitat, and long-term productivity. TPCC fragile classifications have identified areas having soils prone to landsliding or surface erosion. Alternatives which have more site disturbing activities, including timber harvest on areas classified in TPCC as fragile, slope gradient and fragile, and mass movement potential sites (see Table 4-2) have more potential for increasing the natural rate of mass failures.

There would be a higher potential (on a per acre basis) for erosion and mass wasting under alternatives NA, A, B and on the intensively managed forest acres under alternative D and E. Alternative C and the preferred alternative would have the least potential (on a per acre basis) for erosion and mass wasting because of the retention of live trees on harvest units. On a cumulative basis, the 6,700 acres that would be harvested under alternative E would have the least total impact and the 74,000 acres that would be harvested under alternative A would have the most impact. The increased soil stability under alternative C and the preferred alternative compared to clearcuts under NA, A, B, D, and E would vary with the number of trees retained per acre on harvest units. The minimum number of trees retained under alternative C is approximately 12 to 15 trees per acre, while the minimum number of trees retained under the preferred alternative is approximately 6 to 8 trees per acre. Table 4-1 summarizes acres of surface disturbing activities by alternative.

Nutrient Status and Soil Biology

Because of the interdependence between above ground organic matter supplies and soil nutrient cycling and availability, management of the surface organic material can strongly influence soil productivity. Decaying plant components, including large downed woody debris, produce an organic layer on the soil surface which decomposes into soil organic matter. This provides plant nutrients, a supply of energy to soil microorganisms, and a medium for water storage. Soil microorganism activity has been directly linked to soil productivity (Harvey et al., 1979). Nitrogen is a limiting growth nutrient in many Pacific Northwest sites, and the surface organic layer (duff) is a primary source of nitrogen for tree growth.

Harvest intensities that remove the most organic material from a site have the most potential for decreasing long-term soil productivity. Similarly, high intensities of site preparation (eg. high intensity, long duration fire, "clean" mechanical piling) potentially have the greatest impact. The potential for long-term soil productivity impacts would be greatest when harvesting and/or site preparation activities are most frequent. Harvesting and site preparation activities would be most frequent under alternatives NA, A, B, and the intensively managed forest acres under alternatives D and E. These alternative were modeled with an approximate minimum harvest age of 40 years. Alternative C and the preferred alternative would have the least frequent harvest and site preparation activities. Alternative C would use a 150 year rotation with a minimum harvest age of 60 on previously clearcut stands. The preferred alternative would use a 300 year rotation in OGEAs, a 150 year rotation in connectivity areas and an approximate 100 year cumulative mean annual increment (CMAI) in the general forest management area (connectivity areas and general forest management area would have a minimum harvest age of 60 years on previously clearcut stands). Intensities of harvesting and site preparation activities are designed to avoid or minimize soil damage (see Chapter 2, "Management Direction Common To All Alternatives" section and BMPs, Appendix 2-1). Prescribed burning would be avoided on highly sensitive (category 1) soils, in most instances. On other soils, burn prescriptions would be designed to protect beneficial soil properties and result in moderate and low intensity burns (see Chapter 2). If this protection does not occur, long-term soil productivity may be decreased. Differences in management practices used and acres harvested and site prepared between alternatives are the most direct indicator of relative risk to soil productivity decreases due to organic matter reduction (see Table 4- 1 and Appendix 4-4). Practices that would have the greatest potential for impacts (on a per acre basis) would be alternatives NA, A, B, D, and E which do not provide for the long term retention of down woody material or the retention of hardwoods on intensively managed forest acres. Alternative C and the preferred alternative would have the least risk (on a per acre basis) of nutrient status and soil productivity decreases due to loss of organic matter because of the forest management practices proposed under those alternatives compared to alternatives NA, A, B, D, and E. The forest practices that would help retain long term site productivity under alternatives C and PA would be the retention of snags and down woody material, and the retention of large conifers and hardwoods on all harvest units. On a cumulative basis, alternatives NA, A, and B would have the highest potential for adverse impacts while alternatives C, D, E, and PA would have the least potential for adverse cumulative impacts to soil productivity. However, if proper soil management practices are utilized as planned, soil organic matter and related long-term soil productivity would be insignificantly affected in all alternatives. Adverse impacts to soil productivity from acivities such as mining and recreation have generally been of an isolated and insignificant nature. These activities are expected to continue at this level under all alternatives.

Differences between alternatives in the amount of land fertilized depend on the amount of land allocated for timber production. Generally, all well-stocked stands in the intensive timber base would be planned for fertilization. Fertilization may be used under alternative C and the preferred alternative's connectivity area and OGEAs to hasten acquisition of old-growth character in a stand. Fertilization may be used to enhance growth on well managed sites or to help restore growth on sites where practices have reduced productivity by significantly reducing nutrient status. However, fertilization is not a substitute for replacing organic material that has been removed from a site through timber harvest, site preparation or other means.

Effects on Water Resources

Forest management activities attributable to management alternatives that have been outlined in Chapter 2 would have the potential to impact the water resources since all alternatives entail soil and vegetation disturbance (Appendix 3-3). Impacts that would be of greatest concern are those that would adversely affect beneficial uses, especially domestic water use and salmonids. The BLM is required by the National Environmental Policy Act (NEPA 1977) to analyze all impacts upon water resources which includes direct, indirect, and cumulative effects in the short term (10 years) and long term (200 years).

BLM-administered land is intermingled with other ownership in a checkerboard pattern or one even more fragmented (See Map 1-2). Analysis of impacts to water resources necessarily considers effects of all activities in a watershed regardless of ownership, as all are connected within the drainage system. Therefore, analysis of impacts from activities only on BLM-administered land would have little meaning and would not meet the requirements of NEPA.

Direct effects of proposed alternative action would be those effects that occur close in time and place to the action. Sedimentation is one example that is associated with most ground distrubing activites.

Indirect effects of proposed alternative action would be those effects that occur later in time and offsite from the action. Pool filling and reducing fishery habitat from accelerated sedimentation in the watershed is an example.

Cumulative impacts to rivers and streams in Western Oregon tend to be the averaging of all impacts within the watershed rather than the sum of all impacts within the watershed. This is due to the fact that the flow (quantity of water) increases downstream thereby diluting impacts. Impacts to lakes and small impoundments tend to be additive because the water quantity usually remains relatively constant and site specific. Cumulative impacts over time are usually additive and involve the compounded effects of past, present, and reasonably forseeable future actions. The overall net cumulative impact across both time and space is a complex process.

The degree of intensity and duration of impacts on water resources in a watershed vary in relation to a watershed's sensitivity. These impacts to water resources are discussed in terms of changes to acres disturbed, stream channel condition, large woody debris, condition of the uplands, water quality, and watershed condition in Analytical Watersheds (AWS) that would vary by alternative and include reasonably foreseeable actions on non-BLM lands. A summary of changes in analytical watershed conditions as projected by WCI analysis is shown in Table 4-3. The degree of impact on water resources would be in relation to the existing conditions in analytical watersheds (See Map 3-3) discussed in Chapter 3; "Affected Environment".

Effects Common to all Alternatives

Groundwater quality and quantity would not be expected to be affected by any of the alternatives or management practices described in Chapter 2. The relatively deep soils would effectively filter any potential pollutants from entering the aquifers in both the Coast Range and Cascades mountains. Activities that significantly decrease soil infiltration, such as road construction, would site specifically alter the amount and/or location of water reaching the aquifers. However, changes in ground water quantity would be far too small to measure under all alternatives.

Annual water yield would not be expected to change under any of the alternatives. Research studies on streamflow in western Oregon, not including dominant fog drip areas, have concluded that annual water yield response to sustained timber harvest in larger watersheds similar to the AWSs is less than the accuracy of streamflow measurements (Harr, Fredrikson and Rothacher, 1979; Harr, 1976). However, winter peak flow increases can be in response to compaction in the watershed or canopy removal in the transient snow zone and are discussed later in this chapter.

Water temperature is directly affected by solar radiation reaching the stream. Riparian vegetation prevents increases in water temperature by providing the effective shade (Brown, 1980; Brown et al,1971). The objectives of the Riparian Management Areas (RMA) for all alternatives include providing effective shade on perennial streams. Therefore, water temperature would not be expected to vary between the alternatives. However, other RMA functions such as large woody debris would have different criteria and require separate evaluation.

All alternatives would have a similar affect on other water quality constituents such as pH, dissolved oxygen, and nutrients. While seasonal streamflow would show variations in these constituents, significant trends have not been historically observed when riparian dependent resources are addressed.

There would be no difference in mining related impacts between alternatives.

Effects of the Alternatives

Since all alternatives affect water through soil and vegetation disturbing activities such as timber harvesting, road building, log hauling, and ORV use, the amount of activity was used as an indicator of the risk of direct and indirect water impacts. However, streams which presently show evidence of degradation (e.g. pools filling with sediment or channel becoming more abraded and wider), may be of higher future risk depending on the proposed action. Alternatives NA, A, and B would harvest more acres of timber and build more miles of road. The potential effect of these

Table 4-3 Summary of Changes in Analytical Watershed Condition.

	Alternative						
Representative Watersheds	NA	A	B	C	D	E	PA
Total Number Improving	0	0	0	4	5	5	4
Number Improving by 10 Percent or Greater	0	0	0	2	4	5	3
Total Number Declining	6	7	5	3	3	2	3
Number Declining by 10 Percent or Greater	5	5	5	2	3	1	3
Number With No Change	3	2	4	2	1	2	2

alternatives would be most focused on the sub-watershed level. These areas would include portions of Middle Fork Coquille AWS (shared with Coos Bay BLM District); Coffee Creek and Stouts Creek (designated demonstration/experimental watershed) in Upper South Umpqua AWS; Canyon Creek in Lower South Umpqua AWS (the last two streams were heavily impacted by the 1987 wild fire and salvage harvesting and are in early stage of recovery); Pass Creek (designated demonstration/experimental watershed) in Canton Creek AWS; Middle Creek in Cow Creek AWS; and Wolf Creek (designated demonstration/experimental watershed) in Upper Umpqua Frontal AWS. Alternatives C, D, E, and Preferred would harvest less acres of timber and build fewer miles of roads. These latter alternatives provide for varying levels of timber harvest intensity (see Chapter 2 - Timber).

Impacts to Stream Channel Condition

Relative changes to stream channel stability from the present condition are illustrated in Table 4-4 which shows expected changes for the average channel in each watershed. These ratings are based upon observations by field personnel and are representative of the overall condition, including streams on private lands.

Under alternatives C, D, E, and Preferred, there would be a net long term improvement in stream channel condition and fish habitat in all AWS except Calapooya, Lower North Umpqua, South Umpqua/Roseburg, and certain subwatersheds in Rock Creek AWS (East Fork Rock Creek) and Upper South Umpqua AWS (Middle and West forks of Deadman Creek). The net improvement is based on vegetative recovery that would proceed at a higher rate than timber removal. One example would be Middle Creek in Cow Creek AWS where streamside and upland vegetation would grow back and stream channel stability and watershed condition would improve to the benefit of resident and sea-run Cutthroat trout and anadramous winter Steelhead trout and Coho salmon.

All alternatives would provide Riparian Management Areas (RMA) along all perennial streams on BLM lands which address maintaining channel integrity, allowing proper functioning condition, and providing future large woody debris. In AWSs where BLM administers less than 10 percent of the watershed, RMAs would neither

Table 4-4 Expected Stream Channel Stability and Watershed Condition in Analytical Watersheds.

Analytical Watershed	ALT NA	ALT A	ALT B	ALT C	ALT D	ALT E	ALT PA
Upper Smith River	N	N	N	I	I	I	I
Elk Creek	D	D	D	N	N	N	N
Upper Umpqua Frontal	N	N	N	I	I	I	I
Calapooya	D	D	D	D	D	D	D
Lower North Umpqua	N	N	N	N	N	N	N
Rock Creek	N	N	N	I	I	I	I
Canton Creek	N	N	N	I	I	I	I
Little River	N	N	N	I	I	I	I
Myrtle Creek	N	N	N	I	I	I	I
Upper South Umpqua	D	D	D	N	I	I	I
Lower South Umpqua	D	D	D	N	I	I	I
South Umpqua/Roseburg	N	N	N	N	N	N	N
Cow Creek	D	D	D	I	I	I	I
Olalla/Lookingglass	D	D	D	I	I	I	I

Alternatives: D = Decreasing stream stability and lowering watershed condition
I = Increasing stream stability and improving watershed condition
N = No change in stream stability or watershed condition

offset the loss of riparian areas on private lands nor allow for channel system recovery where loss of channel diversity (pool to riffle ratio with variety of size class bed material, large wood component, and limited stream bank erosion) has occurred. For example, Calapooya Creek in the Calapooya AWS where BLM administers only 8 percent of this AWS, has overall lost most of the channel diversity from past logging practices on private lands. However, the value of BLM riparian management areas is important for site specific biological and physical channel needs and in the short term would provide habitat refuge sites. Other AWSs where BLM lands occupy less than 10 percent are Lower North Umpqua, and South Umpqua/ Roseburg.

Peak flow increases during floods may be affected by the varying amount of disturbance under each alternative. Research has shown that peak flow increases can be in response to soil compaction when the impacted area represents at least 13 percent of a small watershed (Harr, 1979). The removal of forest canopy in the transient snow zone (2,000 to 5,000 feet elevation for the Roseburg District) has also been connected to peak flow increases (Harr, 1981; Berris and Harr, 1983; Harr, 1986). Snow accumulation in harvest areas, where the forest canopy has been reduced to less than 70 percent, is available in varying amounts of snowmelt that is driven by warm rain storms. This additional moisture enters the soil and moves to the channels as additional flood flow. Although the snowmelt mechanism is not completely understood, the evaluation of a watershed susceptability to rain-on-snow storms would determine the hydrologic condition and potential risk of peak flow increases. Knowing the current channel condition and percent of watershed area in equivalent clear cut would best address the risk of peak flow increase which would affect channel stability, fishery and aquatic habitat, and road related facilities when implementing each alternative.

The risk of potential impacts on channel condition from peak flow increases would vary between the alternatives. In the short term, alternative E would have the lowest risk. Alternative C would be expected to have less risk than the remaining alternatives because of the partial harvesting with larger basal area retention. Alternatives D and preferred would allow for a range of management which would lessen the potential of peak flow increases. Such offsetting strategies include no planned timber harvest in HCAs under alternative D, and 80 year deferral with extended rotation and basal area retention in the OGEAs under the preferred alternative. In the long term, these four alternatives (C, D, E, and the preferred alternative) would allow subwatersheds that are currently at a reduced level of hydrologic condition and either exhibiting peak flow impacts in the channels or at risk the needed time to recover. Alternatives NA, A, and B would have higher risks.

Three example subwatersheds in the transient snow zone that have reduced hydrologic condition and are showing signs of cumulative channel impacts are East Fork Rock Creek (in Rock Creek AWS) and the Middle and West Forks of Deadman Creek (in Upper South Umpqua AWS). The lower reach of East Fork of Rock Creek is aggrading and becoming a riffle and abraded system controlled by shifting gravel bars. Annual winter floods are no longer contained within the stream banks. The Middle and West forks of Deadman creeks in the lower reach are showing evidence of pool filling. For these subwatersheds, continued current harvesting levels associated with alternatives NA, A, and B would not allow watershed or channel recovery.

Impacts to Large Woody Debris

Large woody debris management by alternative would be directly affected by the condition of riparian vegetation (see Appendix 3-3; see also the Riparian and Fisheries sections of this chapter) as the amount and effectiveness of large woody debris left under the various alternatives would correlate to the proper functioning of streams and rivers and to the overall condition of fish habitat.

The successful implementation of the Best Management Practices (BMP), which are listed (Appendix 2-1) as "Management Direction Common to All Alternatives" (Chapter 2), would prevent any significant short term changes in the amount of large woody debris in BLM streams that are third order and larger under all alternatives. In most cases, the wood grown would eventually (long term) replace large woody debris that has been removed by past pratices or naturally broken down, thereby providing a net long term improvement. The retention of large woody debris would continue to provide habitat for aquatic organisms, regulate flow, reduce flooding, maintain or increase low flows, prevent erosion, and trap sediment.

A long term effect of decreasing large woody debris in first order intermittent streams in all AWSs would occur under alternatives NA, A, B, and D. This potential future loss would not be as great under alternatives C, E, and preferred. Alternatives C and preferred would retain various numbers of trees per acre as the future source of large woody debris and alternative E would establish a no planned harvest RMAs on first order streams. A similar long term effect on second order intermittent streams would be expected except under alternatives D and E where a no planned harvest RMA would offer improvement. On the Analytical Watershed level, it is assumed that very little riparian protection would be afforded to order one and two streams on non BLM lands.

Impacts to the Upland Condition

Maintenance and improvement of upland conditions would take place as BMPs become refined through increased awareness of hazards (eg; compaction or landslides) and improvement of control methods. At the very least, BLM would prevent degradation of their upslope lands.0 Deferral of harvest units because of potential watershed cumulative impacts would prevent significant impacts associated with peak runoff events.

Under alternatives C, D, E, and preferred, overall upslope conditions in AWSs would be least affected compared to alternatives NA, A, and B. Those portions of AWSs upland conditions within HCAs in alternative D and within OGEAs in the preferred, would improve over the long term. Leaving trees in harvest units under the high retention prescription of alternative C (see Chapter 2) would have a mitigative affect on potential peak flow increases by retaining some of the effective canopy.

Impacts to Water Quality

Water quality parameters that are most commonly associated with forest management are stream temperature, instream structure or large woody debris, and sediment (see Chapter3 - Existing Water Quality Conditions). Temperature and large woody debris have been previously discussed in this section. The 1988 Oregon Statewide Assessment of Nonpoint Sources of Water Pollution identified one or more streams in each Analytical Watershed with moderate sediment problems and three Analytical Watersheds with at least one stream each in the severe category. Stream sedimentation is associated with ground disturbing activities (eg; timber harvest, roads, log haul, and ORV use) and peak flows. Alternatives NA, A, and B would have the highest potential risk of increased stream sediment. The increased risk would be a result of acres of disturbance and potential peak flow increases. The amount of disturbance would provide a sediment source while peak flow increases would increase channel scour. The varying harvest intensities between alternatives C, D, and the preferred would have differing effects on the availability of sediment from ground disturbance and potential peak flow increases (see previous peak flow discussion). The potential risk of producing sediment would be more under alternatives D and the preferred than alternative C. Alternative E would have the lowest potential risk.

Impacts to Overall Watershed Condition

The alternatives appear to fall into three categories in the preceding water resource discussion. Alternatives NA, A, and B would have the greatest potential of affecting water resources by harvesting more acres and building more miles of road, harvesting on a shorter rotation and not allowing vegetative recovery to more fully occur, risking higher peak flow increases, decreasing available future large woody debris in first and second order channels, and risking higher sedimentation increases. Alternatives C, D, and the preferred would group in the middle gaining the benefit of different timber management strategies and reserve areas. Alternative E would have the least impact on water resources by disturbing less acres and providing riparian management areas on all stream orders.

A relative watershed condition index, that was described in Chapter 3, was used to evaluate the alternatives by comparing the potential overall change in the AWSs to the current condition. The method of deriving the watershed condition index (WCI) is described in Appendix 3-6. Both the current and the projected condition have combined BLM and private timber harvest in order to evaluate the overall watershed cumulative condition. A summary of changes in the condition of analytical watersheds as projected by the WCI are shown in Table 4-3. The projected timber harvest on private lands was the most difficult assumption to include. For the analysis, fifty percent of private harvestable timber was used. The AWSs that contain more than 25 percent BLM managed land were evaluated. The AWSs were also grouped by the current relative watershed condition index. The higher index group included Cow Creek, Lower South Umpqua, Myrtle Creek, and Upper South Umpqua. The lower index group included Canton Creek, Little River, Rock Creek, Upper Smith River, and Upper Umpqua Frontal. The change in relative watershed condition index compared to the current condition reflects the projected amount of disturbance and recovery occurring over the 10 year planning period.

The results of this analysis are displayed in the Appendix 4-5. In general, most AWSs would show relative improvement or no change under alternatives C, D, E, and the preferred. The exceptions would be Myrtle Creek, Upper South Umpqua, and Upper Umpqua Frontal where relative watershed condition index would decline under at least two of the alternatives when compared to the current condition. Under alternatives NA, A, and B, the relative watershed condition would more often decline. The exceptions would be Cow

Creek, and Upper Smith River where at least one of the alternatives would show relative improvement or no change.

Effects on Biological Diversity

To attempt to address the ultimate question of how well the alternatives would help to maintain viable populations of native species in functional habitats, this section discusses the following focal components to biological diversity: species diversity, genetic diversity, ecosystem diversity, and landscape diversity. Primary activities affecting biological diversity on BLM-administered lands would be timber harvest and reforestation practices. Analysis of impacts on these elements is uncertain, as biological diversity has not been intensively researched. Thus, a number of indicators of diversity have been selected for analysis.

Although the baseline for assessment of impacts is the existing situation, biological diversity is best analyzed in the context of the model provided by nature. Using the model provided by nature is not possible since human activities have been affecting the ecosystems of western Oregon for thousands of years, and have substantially affected the ecosystems in the last 140 years, as described in Chapter 3. Appendix 4-12 discusses the methodology for assessing effects on biological diversity. Tables 4-5 and 4-6 show the retention and improvement of biological diversity for both short and long term.

Effects on species diversity would occur mostly on lands allocated to timber production. Management of lands allocated to timber production would emphasize growth of commercial conifers, except in alternative C and in OGEAs and connectivity areas under the preferred alternative. Artificial reforestation in other alternatives would be primarily with Douglas-fir. Subsequent vegetation management would suppress competing vegetation (e.g., grass, shrubs, and forbs) to favor Douglas-fir. After an initial drop following harvest of old-growth stands, plant species diversity increases, peaking between 15 and 20 years. This early high diversity is short lived in most managed as well as natural stands. After the tree canopy closes, plant species diversity declines to its lowest level before slowly recovering again (Schoemaker and McKee 1988). Bruce et al. (1985) show that the early seral stage provides feeding habitat for the most animal species, while mature and old-growth forests provide nesting habitat for the most species.

Analysis of BLMs forest inventory data indicates that timber management actions would not substantially diminish the high level of diversity in the cutover stands, but it would accelerate succession in all alternatives except alternative C and in the OGEAs and connectivity areas under the preferred alternative, shortening the length of time in the early seral stage

Table 4-5. Comparison of Alternatives, Retention and Improvement of Biological Diversity, Short Term (10 years).

	Alternatives						
Aspect of Biological Diversity	**NA**	**A**	**B**	**C**	**D**	**E**	**PA**
Genetic Diversity	0	0	0	0	0	0	0
Special Status Animals	-	-	-	-	-	+	-
Special Status Plants	-	-	-	-	0	0	0
Special Habitats (talus, meadows)	-	-	-	0	0	0	0
Hardwoods	-	-	-	0	-	0	-
Riparian Zones	-	-	0	0	0	0	0
Research Natural Areas	-	-	-	0	0	0	-
Older Forest (Open Canopy)	-	-	-	-	-	0	-
Early Seral Stage	+	+	+	+	+	-	+
Snags/Wildlife Trees	-	-	-	-	-	+	-
Dead and Down Material	-	-	-	-	-	+	-
Fragmentation of Older Forest	-	-	-	0	0	0	0

+ improving; 0 maintaining; - declining

Table 4-6. Comparison of Alternatives, Retention and Improvement of Biological Diversity, Long-Term (100 years).

	Alternatives						
Aspect of Biological Diversity	**NA**	**A**	**B**	**C**	**D**	**E**	**PA**
Genetic Diversity	0	0	0	0	0	0	0
Special Status Animals	-	-	-	-	-	+	-
Special Status Plants	-	-	-	-	0	0	0
Special Habitats (talus, meadows)	-	-	-	0	0	0	0
Hardwoods	-	-	-	0	-	0	0
Riparian Zones	-	-	0	0	0	+	0
Research Natural Areas	-	-	-	0	0	0	-
Older Forest (Open Canopy)	-	-	-	-	-	+	-
Early Seral Stage	+	+	+	-	-	-	-
Snags/Wildlife Trees	-	-	-	+	+	+	+
Dead and Down Material	-	-	-	+	+	+	+
Fragmentation of Older Forest	-	-	-	+	+	+	+

+ improving; 0 maintaining; - declining

when that high level of diversity prevails. The inventory data further indicates that, as the conifer stands reach closed-canopy condition, the abundance (number of trees) of other tree species in the canopy would typically be less than in the original stands, but the composition of tree species would usually be the same. Diversity of shrubs, forbs and grasses would decline. This lower species abundance would occur to varying degrees in all alternatives, but would be less under alternative C and the preferred alternative where reforestation would include a diversity of species, and management would encourage species diversity. In the long term, alternatives E, D, and PA would have the least acres in both the early seral stage and closed canopy conditions, while alternatives NA, A, and B would have the most in early seral stages and the least in older forest canopy conditions. Appendix 4-13 shows average percent species composition, current condition and by prescription at end of rotation.

Although the existing plant communities are adapted to the occurrence of fire in the natural system, prescribed (slash) burning after logging would affect both the structure and composition of upland vegetation communities (Halpern 1987). Burning would reduce the amount of coarse woody debris, kill or destroy some retained trees, supress the growth of most residual vegetation, and promote the growth of certain non-native invader species as compared to unburned stands. General recovery would occur over time. The rate of recovery would be highly variable depending on the method of timber harvest, intensity of burn, and the composition of the original vegetation. Impacts of burning after logging would be most often limited to the short term. Figures 4-2 and 4-3 show the relative abundance of seral stages for the short and long term by alternative.

Wildlife species diversity is greatest when the forest is dominated by a mix of old-growth/mature and early successional stages. A patchwork of this mix, if it includes some large, older forest patches, favors species adapted to both seral stage extremes and species adapted to the ecotones (edges) that occur between the extremes (Logan et al. 1985). Species diversity is least where the mid and late seral stages of regulated forests dominate the landscape (Long 1977), and canopy closure is greatest. Appendix 4-14 displays seral stages by ASQ base allocation; current, short term and long term for alternatives.

Species occupying different successional stages tend to differ in certain life history characteristics in ways related to habitat mix. In the Pacific Northwest, natural disturbances that created large expanses of early-successional habitat were relatively infrequent, hence most animal species of forests are adapted to a landscape dominated by old-growth and punctuated by early successional islands of varying size. Because of

Table 4-7. Acres of Stands in the Commercial Forest Landscape Expected to Attain Old-Growth Structural Characteristics within 100 Years*

Alternative	Acres of Stands Meeting Old-Growth Definitions Lands Available for Timber Production	Lands Not Available for Timber Production	Total
NA	0	39,900	53,300
A	0	22,500	22,500
B	200	45,800	46,000
C	74,600	72,400	147,000
D	200	115,800	116,000
E	5,000	174,900	175,400
PA	64,600	34,900	99,500

*Old-Growth defined as either unmanaged stands older than 195 years, or managed stands which meet the definition in USFS PNW 447.

this pattern, species that specialize in early successional habitats tended to evolve certain characteristics that allowed them to survive in these rather fleeting environments, including: rapid population growth, wide dispersal capacity, and relative flexibility in habitat requirements. Old-growth related species, adapted to a more dependable habitat, tend to be specialists that often have relatively slow population growth rates and poor dispersal capabilities (Crow 1990).

In even-aged stands the younger and older forest age classes provide the greatest species diversity, while the intermediate age classes (mid and late seral stage 20 - 100 years old) which typically have closed canopies are far less diverse (Long 1977, Shoemaker and McKee 1988 and Bruce et al. 1985). The comparative indicators of species diversity thus would be the acreages of early, mature and old-growth stages for each alternative. Alternatives that maintain or increase older forest habitats would, however, benefit species diversity more than those that maintain or increase the early seral stage. The habitat generalists that adapt to the early seral stage would be expected to survive at viable levels despite habitat losses. Leaving a legacy of living and dead standing trees in the preferred alternative and alternative C would increase the species diversity observed in the intermediate age classes as compared to the other alternatives. Figure 4-5 projects short-term acres by seral stage and open vs. closed canopy for each alternative.

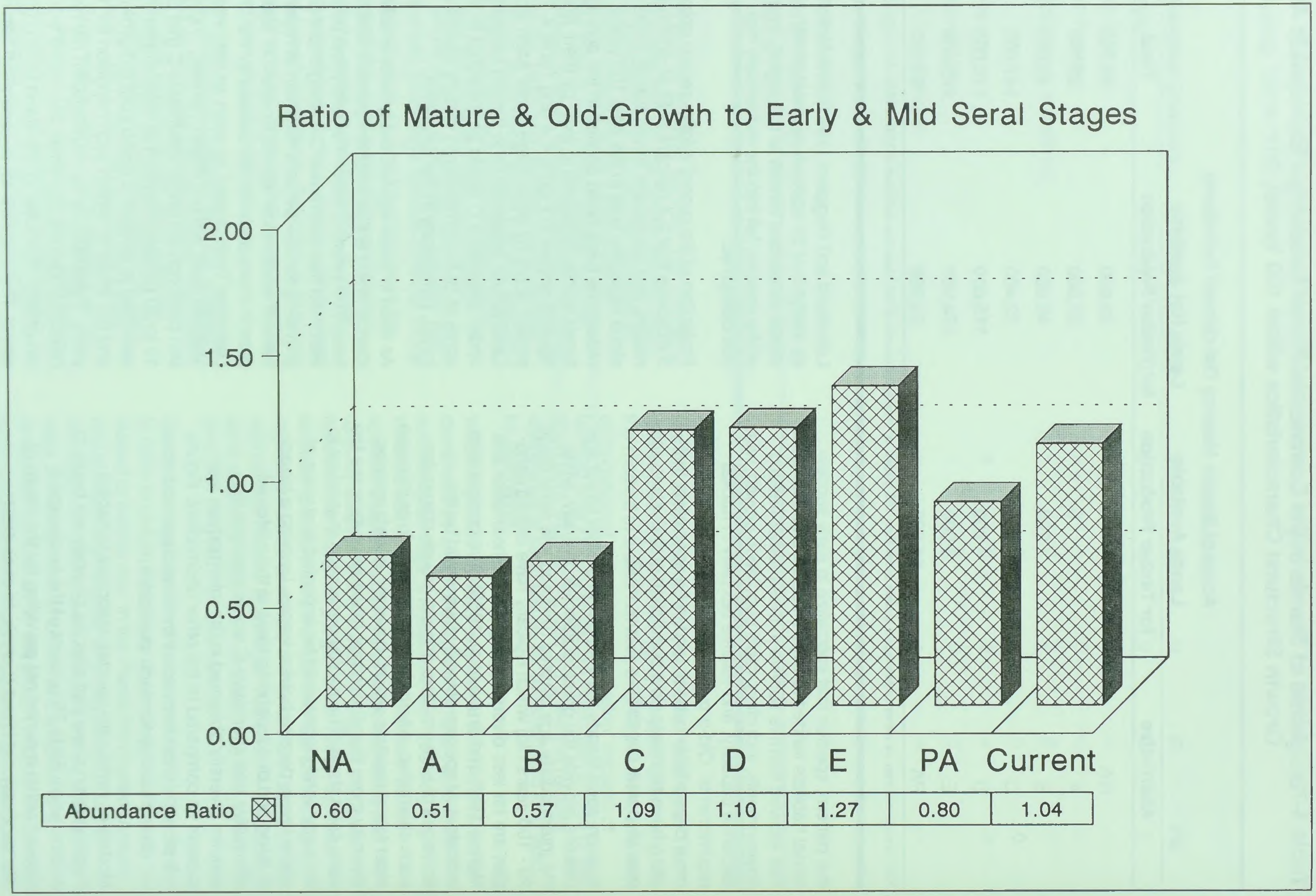
Models of vertebrate species response to habitat fragmentation show that species diversity will begin to decline when 50 to 75 percent of the landscape is cutover within a period not providing for the return of late successional forest (Lehmkuhl et al. 1991).

Lehmkuhl and Ruggiero (1991) developed a vulnerability analysis of 93 species associated with late successional coniferous forests of the region. Eighty precent of the species fell into the moderately high and high risk categories.

Projection of the recent wildfire record noted in chapter 3 indicates that 2.4 percent of BLM-administered mature and old-growth forest stands could burn in stand replacing fires in the next 100 years. Such reductions have been applied to the acreage of older forest stands projected to exist by then, and a net figure is shown in Figure 4-4 and Table 4-7, which project acres by seral stage under each alternative. Land tenure adjustments to benefit biological diversity under alternative C would be expected to increase the acres of BLM-administered mature closed canopy forest, particularly in the long term.

As used in these figures, old-growth is defined as stands which are at least ten percent stocked with trees 200 years or older. For analytical purposes, it is assumed that alternative C management prescriptions providing for 35+ percent retention at regeneration harvest would allow stands to retain or attain old-growth characteristics (as defined by the Old-Growth Definition Task Group) as soon as they would have attained them without timber harvest. Those regeneration prescriptions under alternative C that provide for 15 to 20 percent retention at regeneration harvest are assumed to remove a stand from old-growth condition and not attain or regain such condition for 100 to 120 years. Prescriptions for regeneration harvests in OGEAs under the preferred alternative would retain old-growth character at the stand level (100 to 200 acres). Prescriptions for regeneration harvests in

Figure 4-2. Relative Abundance of Seral Stages
Short Term (10 years) by Alternative



	NA	A	B	C	D	E	PA	Current
Abundance Ratio ▨	0.60	0.51	0.57	1.09	1.10	1.27	0.80	1.04

Figure 4-3. Relative Abundance of Seral Stages
Long Term (100 years) by Alternative

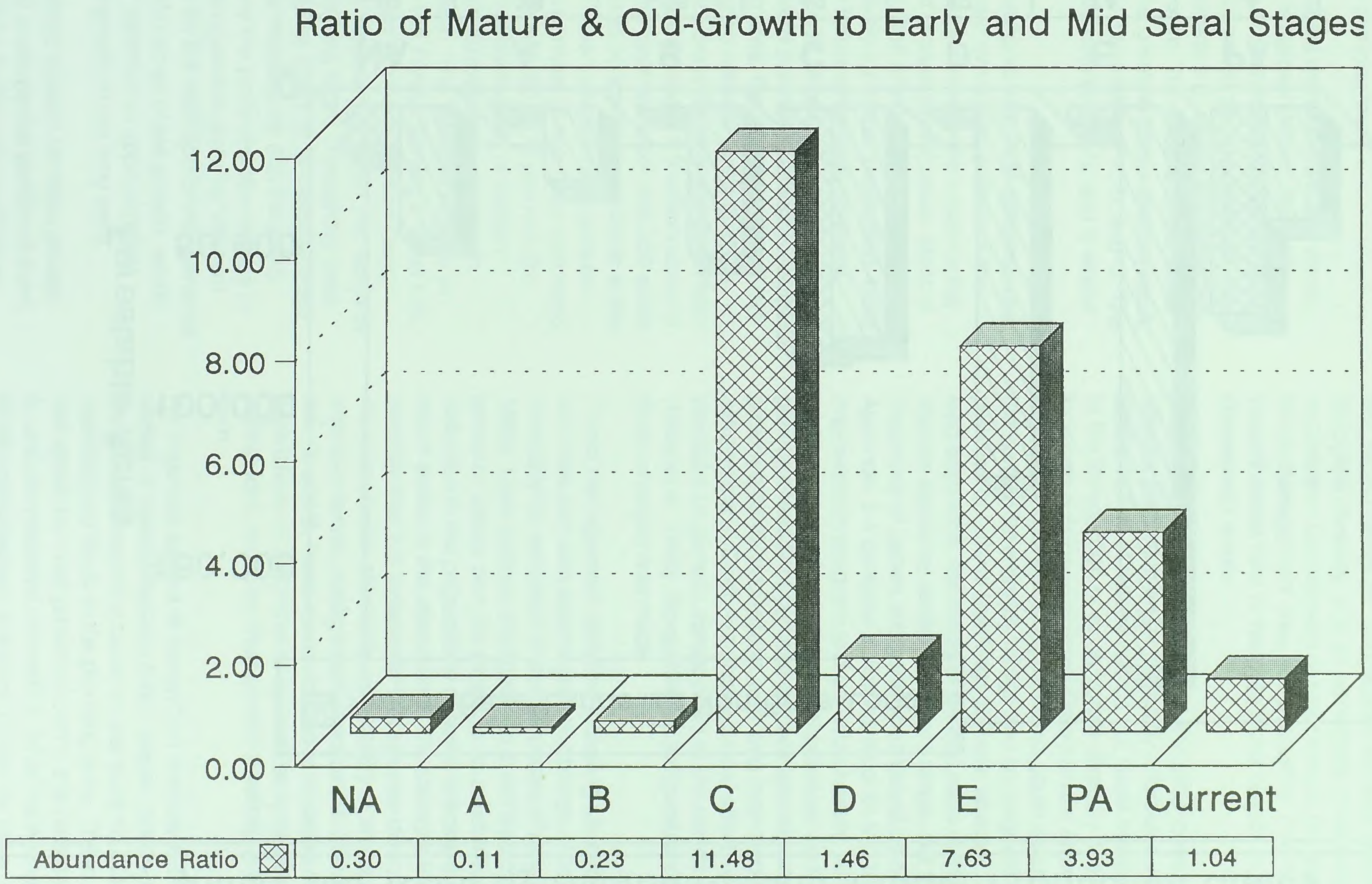
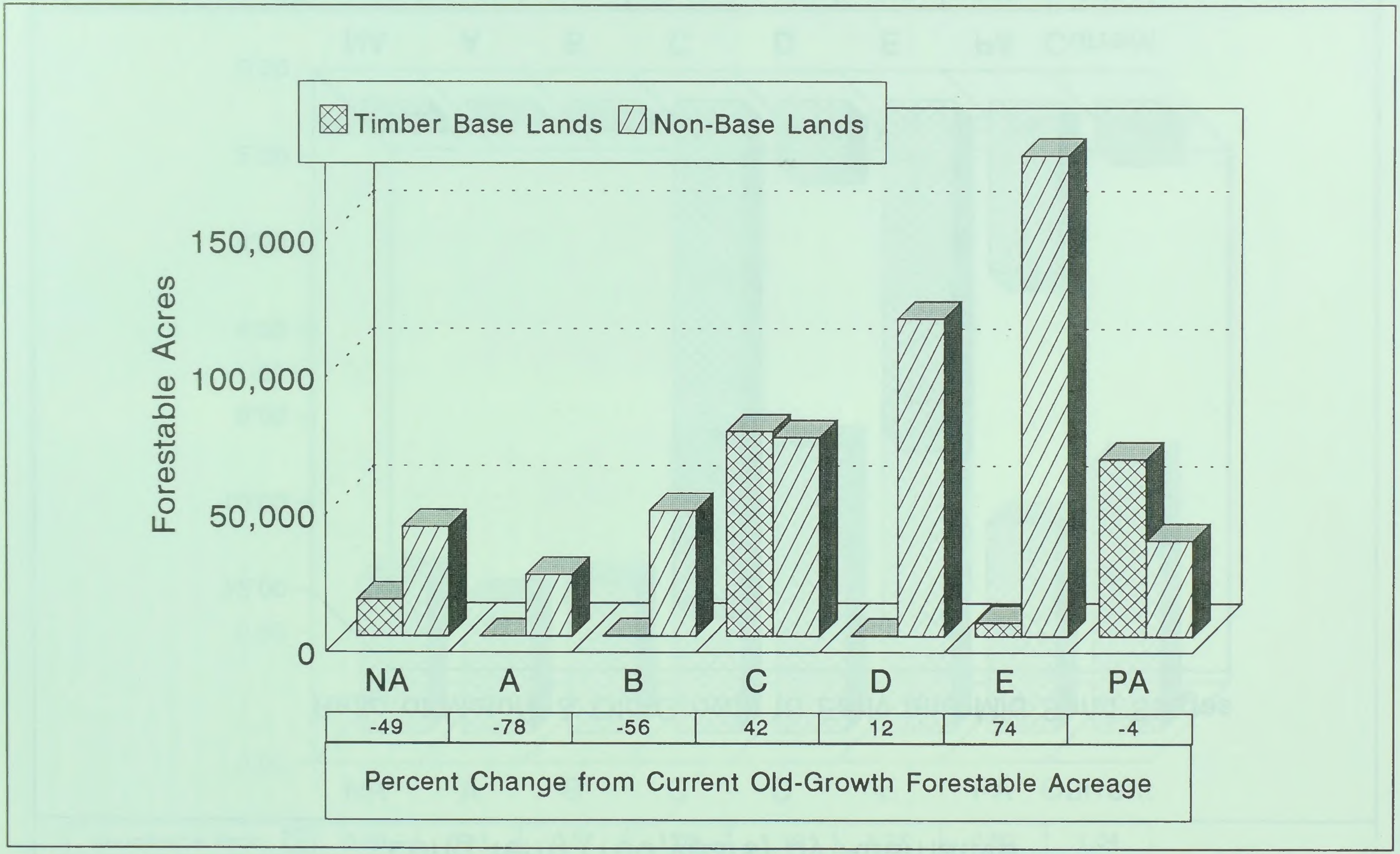


Figure 4-4. Acreage Expected to Attain Old-Growth Structural Charactistics
Within 100 Years by Alternative and Timber Production Status



Old-Growth defined as either unmanaged stands 196+ years of age or managed stands which meet definition in USFS PNW Research Note 447.

connectivity areas under the preferred alternative would remove a stand from old-growth condition and not regain such condition for 100 to 120 years. It is assumed that 25 to 33 percent of the stands managed under prescriptions providing for 15 to 20 percent retention in alternative C and prescriptions in connectivity areas under the preferred alternative would be in old-growth condition in the long term.

A particularly scarce habitat component is low elevation (below 1500 feet) old-growth forest. Currently, there are 34,628 acres of such forest stands on BLM-administered lands. This would decline under all alternatives except alternative E, where it is expected to increase in the long term. The decline of low elevation old-growth would be greatest under alternatives A, NA, then B, followed by alternatives PA, D, and C. The differences between alternatives PA, D, and C would be negligible.

Most forest lands intermingled with BLM-administered lands in the checkerboard ownership pattern of the planning area are privately owned, with a substantial portion owned by wood products companies. Most of these lands have been, and are expected to continue to be, managed intensively for timber production. Little mature and old-growth forest will remain on these lands, so such forests on BLM-administered lands and national forest lands would provide essentially all that remains in the planning area. Recent estimates of old-growth forest remaining on national forest lands in western Oregon, by the Forest Service and the Wilderness Society, have identified about 1.9 million acres of such lands. Added to the approximately 400,000 acres of old-growth stands on BLM-administered lands in the region, this represents fifteen percent of all western Oregon forest lands. In contrast, it has been estimated that prior to white settlement, 60 to 70 percent (the amount was not static but fluctuated) of western Oregon and Washington forests were old-growth (Franklin and Spies, 1984). The National Forests in western Oregon under the Forest Service's "Final EIS, Management Direction on Northern Spotted Owls," 1992, would provide for retention of 1,260,000 acres of old-growth stands in the long term. Throughout western Oregon, the cumulative effect of all national forest plans, as they would be modified by that Final EIS preferred alternative and the preferred alternatives in BLM draft resource management plans for western Oregon, which provide for the retention or maintenance of approximately 473,450 acres of old-growth, would be the maintenance or retention of approximately 1,733,450 acres of old-growth in the long term.

The relatively short harvest rotation on many private forest lands means that a substantial portion of them, at any given time, would be in the early seral stage, with most of the remainder in the mid seral stage. In a cumulative sense, these two seral stages would dominate throughout the future on the sum of all ownerships in the planning area.

The proposed harvest of 14,700 acres of old-growth stands during the first decade in the preferred alternative, would cause an unavoidable adverse reduction in biological diversity, and an essentially irreversible and irretrievable commitment of resources in the general forest management area and at least for the 100 to 120 years it would take to recreate those stands in the connectivity areas.

Genetic diversity of Douglas-fir and other commercial species planted in areas artificially reforested would be similar to that of natural stands but could increase due to the introduction of stock from a diversity of similar locations outside each immediate harvest area, although a countervailing decrease could occur due to the competiteve disadvantage and consequent suppression of natural seedlings of those species. Planning area-wide, the range of genetic traits of these species would be similar to today's range, but the frequency of genes and genetypes would be altered. Appendix 2-4 contains a discussion of BLM's tree improvement program and genetic diversity. Although studies of impacts of silvicultural practices on the genetic diversity of commercial tree species have provided conflicting results, one long term study of Jeffery pine in California showed clear effects of some practices on genetic composition of the stands studied (Millar et al. 1990). No qualitative judgement about those changes was made.

Forest management activities including silvicultural practices can also lead to genetic change, most obviously by exclusion of some species (Franklin et al. 1981). Less obvious changes can entail loss of specific genes or alleles due, for example, to substantial reduction in the populations of some species such as noted earlier in this discussion. The changes in genetic diversity that are independent of species diversity are not expected to affect the survivability of any species. Intensive forest management practices in alternatives NA, A, and B, however could lead to isolation of some populations of a number of species as a result of habitat loss, reducing their genetic diversity in the long term.

An important aspect of ecosystem diversity is the variety of special habitats (talus slopes, ponds, bogs, meadows, serpentine barrens) that exist on BLM-administered lands in the planning area. These habitats would be most protected under alternatives C, D, E, and the preferred alternative, by buffering them from timber management activities. Under the other alternatives, special habitats (especially habitats less than one acre) would be vulnerable to incidental disturbance from activities on adjacent lands.

The 1,100 acres of hardwood stands on BLM-administered lands provide another important element of ecosystem diversity. This acreage would, with minor exceptions, remain intact under alternative E, but would be reduced by conversion of some lands (those considered to be conifer sites) to conifer production under the other alternatives. Such conversion would merely return conifers to lands previously converted to hardwoods as a result of logging followed by poor reforestation, but would nonetheless change habitat, reducing and changing species diversity in those areas. The reductions in hardwood acres by alternative are as follows: alt. A: 465 acres, alt. B: 400 acres, alt. C: 270 acres, alt. D: 180 acres, alt. E: 0 acres, preferred alternative: 190 acres. This reduction of hardwood habitat in the preferred alternative is an unavoidable adverse impact.

Intensive timber management practices on a portion of the lands in all alternatives except alternative C would reduce the hardwood component of the conifer stands on those lands, diminishing biological diversity on those lands. Hardwood composition of conifer stands mananged for timber production would be less than that found in the current unmanaged older stands under all alternatives. The low retention prescription of alternative C and the connectivity area prescription of the preferred alternative would most closely approach approximate current average hardwood composition.

Riparian zone condition and research natural area protection, are discussed in the subsequent sections, Effects on Riparian Zones and Effects on Special Areas. The effects of the alternatives on these indicators of biological diversity are summarized in Table 4-5 and 4-6.

Although older forest stands have much greater structural diversity than the young stands that are the result of recent timber management, young stands resulting from the timber harvest practices proposed in all alternatives would have more structural diversity than stands resulting from timber harvest in the 1960s, 1970s, and 1980s, due to retention of down logs and some wildlife trees. This diversity would, however, still be less than that provided by the older natural stands. Management under alternative C and the OGEAs and connectivity areas under the preferred alternative would emphasize retention of structural diversity and over time could increase it. Effects on one specific component of structural diversity - snags/wildlife trees - are discussed in the subsequent section on Wildlife. These effects are summarized in Table 4-5 and 4-6.

Assessment of impacts on the amount of dead and down woody material involved calculation of an index to rate the quality of habitat required by down-log-dependent species (see Appendix 4-6 for an explanation of the methodology and the calculations of the indices by alternative).

The benchmark used in this analysis was the average of 23 tons per acre of large woody debris found in old-growth stands. The material found in other stand conditions was then estimated as a percentage of this level. Indices calculated for the existing condition and for each alternative are shown in Table 4-8.

During the next decade, as a result of continued harvesting on some lands, the amount of dead and down woody material would decline under alternatives NA, A and B, and on those lands of alternatives D allocated for intensive forest management, it would remain the same under alternative E, and it would increase under alternative C and the preferred alternative. In the long term the trend would be similar, except under alternatives D and E, where recruitment of such material in currently young stands excluded from timber harvest would more than offset losses due to logging activity.

Since large dead and down woody material decays only very slowly and all alternatives would leave some such material in harvested areas, only small short-term differences among the alternatives are expected in the amount of such material remaining. In the long term, however, those lands planned for clearcut harvest at relatively short intervals would not regrow trees of large enough size to contribute large down woody material. Thus, within 100 years, such material would largely disappear from the lands managed in that way. This

Table 4-8. Indices of Dead and Down Woody Material by Alternative, Short Term (10 years)

Existing Condition	NA	A	B	C	D	E	PA
1.03	1.00	1.00	1.00	1.07	1.02	1.03	1.06

loss would be greatest under alternative A and least under alternative E. No lands would be managed so as to reduce the amount of such material under alternative C and the preferred alternative.

Cumulative effects of the alternatives and actions on other lands in the planning area are expected to reduce the aggregate amount of dead and down woody material. Most private timber companies use intensive management practices and manage on short rotations, which reduce the amount of such material.

Forest management practices can alter natural function. In addition to timber harvest which may cause loss of seral stages and structure and/or affect canopy opening (thus altering predator-prey relationships), fire suppression and vegetation control can alter natural functional relationships. These effects would be least under alternative C, D, E, and PA, but vary among them. Fire suppression, for example, would have the least effect under alternative C, while timber harvest and vegetation management would have the least effect under alternative E.

A significant aspect of landscape diversity is fragmentation of mature and old-growth forest stands. Of concern are both the size of remnant patches and their isolation or spatial arrangement. Figures 4-5 and 4-6 show the number and total area of old-growth blocks of various sizes of contiguous land in such stands are expected to remain under each alternative in the short term (ten years after plan implementation). As indicated earlier, projection of the recent wildfire record would indicate that 2.4 percent of BLM-administered mature and old-growth forest stands would be burned by stand-replacing wildfire in the next 100 years, but does not provide a basis for projecting loss of a specific number of older forest blocks.

For all alternatives, the loss of old-growth blocks due to major disturbance events was projected by random selection of the acreage reductions made of Table 4-7. The largest of these blocks, which would exist in the long term under alternative E, would probably not be large enough to provide habitat for wide-ranging animals such as fishers, wolverines and lynx, that rely substantially on undisturbed habitat. Other species substantially reliant on such habitat would probably be supported by the blocks that would be retained under alternatives D, E and the preferred alternative.

Note: This complex analysis could only be accomplished using computerized maps. The No Action alternative is based on obsolete (1970s) inventory data, which is not mapped in BLM's Western Oregon Digital Data Base. Thus, no conclusions are provided for that alternative.

A similar analysis has been conducted to identify how many blocks of mature and old-growth combined and interior old-growth forest would exist in the short term. As discussed in Chapter 3, effective interior old-growth forest is considered, in this analysis, to occur at least 400 feet from an edge with an adjacent stand younger than age class 70. For long-term analysis, all non-federal lands and all federal lands allocated to intensive timber production were expected to create such edge; other federal lands were not. Figures 4-7 through 4-10 show the results of this analysis.

Alternatives D and PA would, in the long term (100 years), create five blocks of old-growth as a result of allocations for HCA 1, 2, and 3 or allocations for OGEAs, barring their disturbance by major catastrophic events.

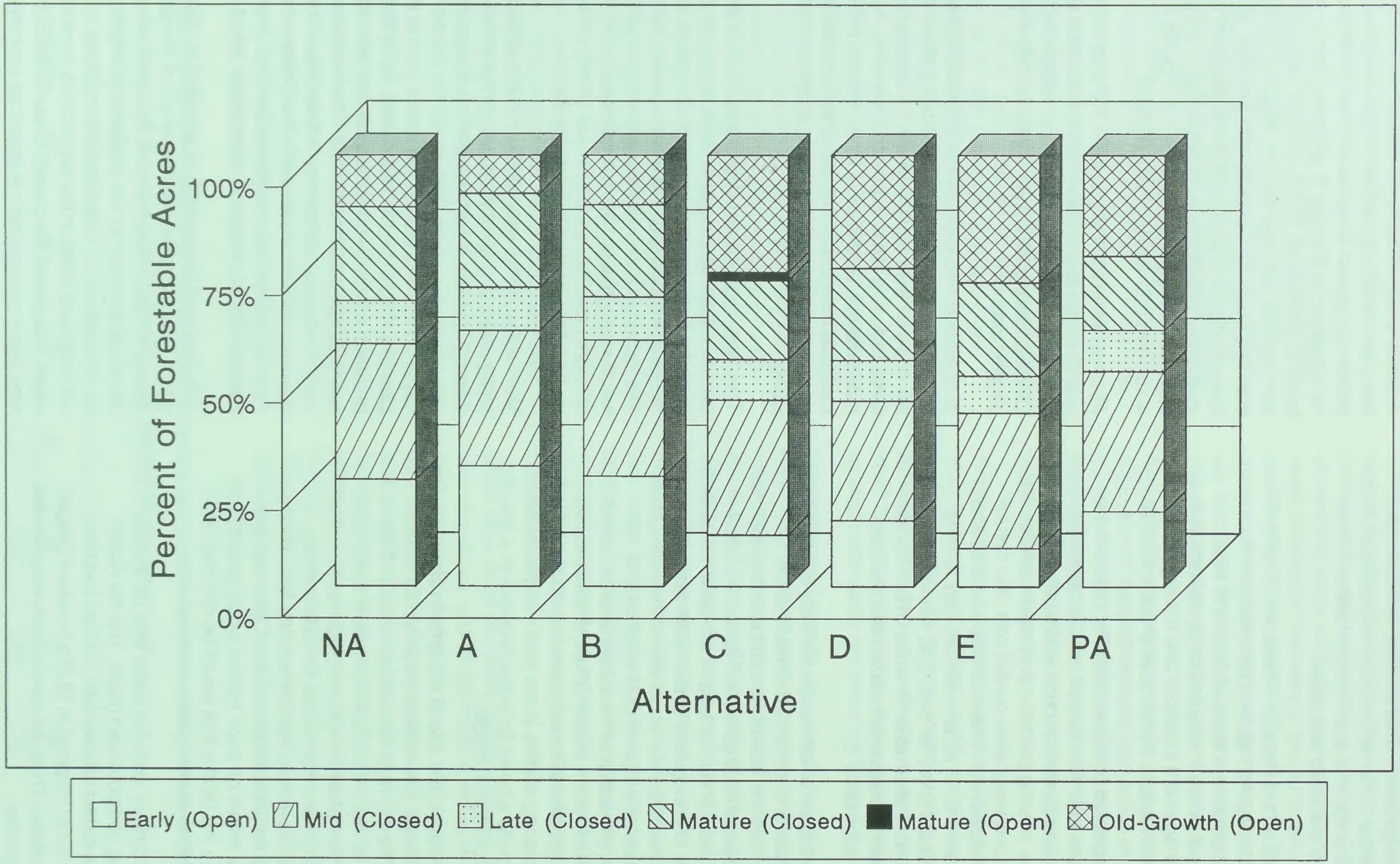
In all alternatives many of the blocks identified would be dissected by roads not planned for closure due to the need for their continued use for access to other lands including lands in private ownership. Additional roads may be constructed, even through the blocks excluded from timber harvest under an alternative, due to the terms of existing reciprocal right-of-way agreements.

They also might be constructed by BLM through blocks excluded from harvest, to provide access to other lands for timber management, if alternative access routes are considered more ecologically damaging. The impact of these various existing and possible future roads has not been considered in identification of interior habitat, but they would clearly diminish the quality of the habitat in these blocks.

Most of the blocks expected to remain at the end of 10 years under any alternative are concentrated in the east or Cascade Mountains portion of the planning area. In the long term (100 years) the blocks would be better distributed, though few would exist in the planning area except in alternatives C, D, E and the preferred alternative, where blocks of older forest would be quite well distributed. The blocks would provide some useful connectivity between the major reserves (wilderness areas) in the Siskiyou National Forest, Siuslaw National Forest and the Umpqua National Forest, except in alternatives NA, A, and B.

The strongest connectivity is provided by alternative E which provides substantial reserves of old-growth for a variety of resources. The next strongest connectivity would be provided by the blocks in alternative C which are buttressed by a management scheme on BLM-administered lands in the connectivity corridor that will retain substantial old-growth characteristics throughout time. Next strongest is the preferred alternative, which retains large blocks of old-growth in OGEAs and links

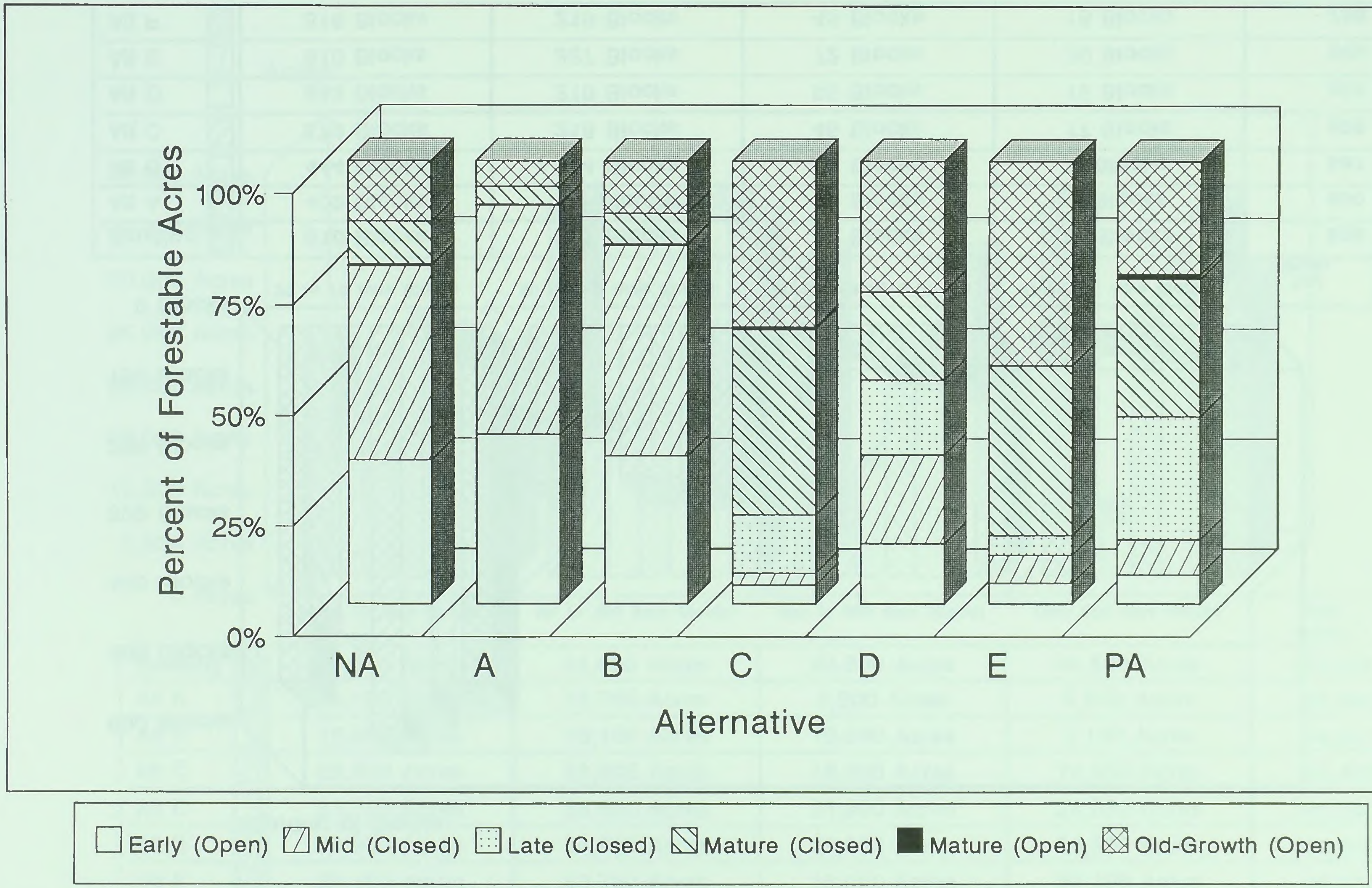
Figure 4-5. Forest Seral Stages and Canopy Condition
Short Term (10 years) by Alternative



Mature "Open Canopy" represents high retention regeneration harvest.

Early	Mid	Late	Mature	Old-Growth
(0-10)	(20-40)	(50-90)	(100-190)	(200+)

Figure 4-6. Forest Seral Stages and Canopy Condition
Long Term (100 years) by Alternative

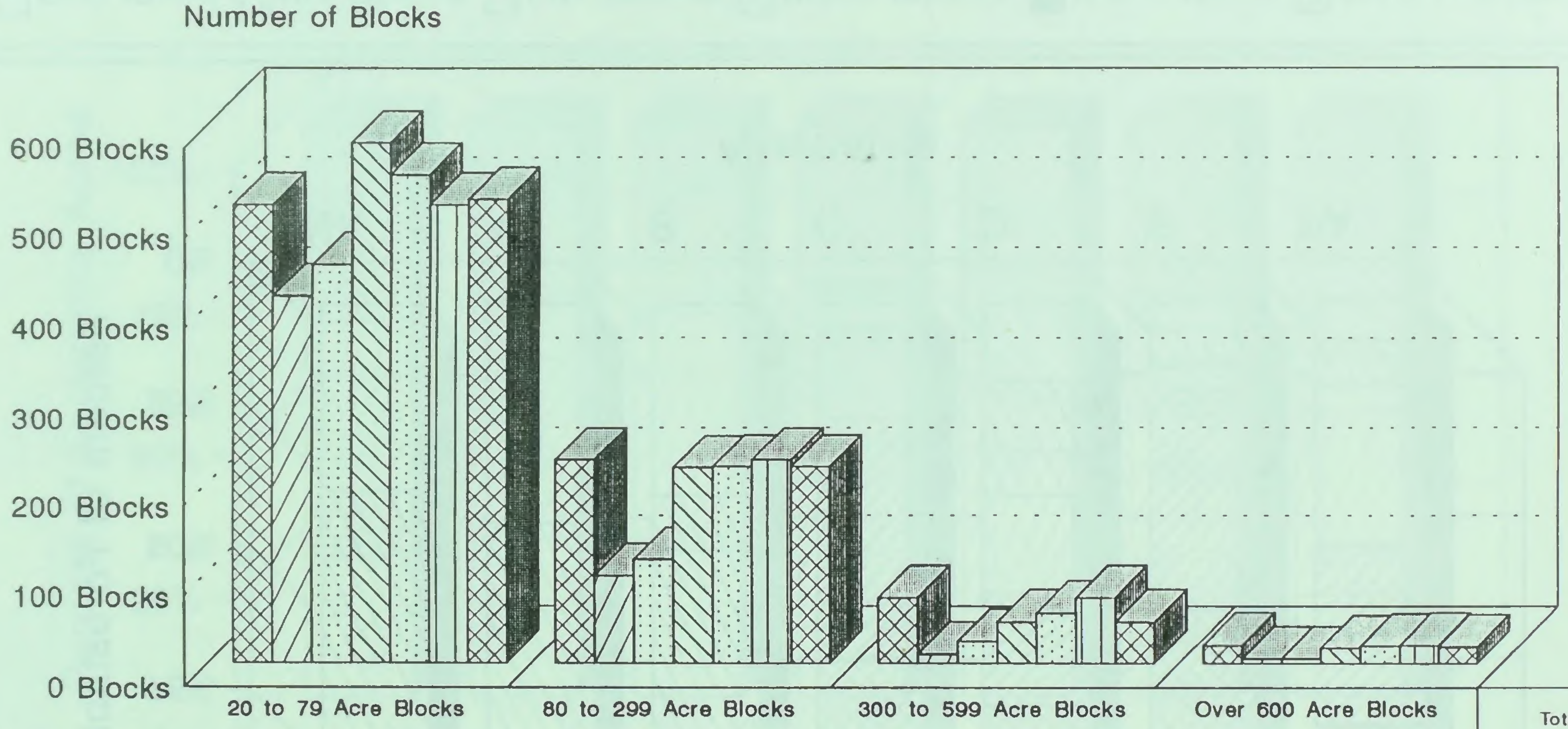


Mature "Open Canopy" represents high retention regeneration harvest.

Early	Mid	Late	Mature	Old-Growth
(0-10)	(20-40)	(50-90)	(100-190)	(200+)

Figure 4-7. Roseburg Ten Year Biodiversity

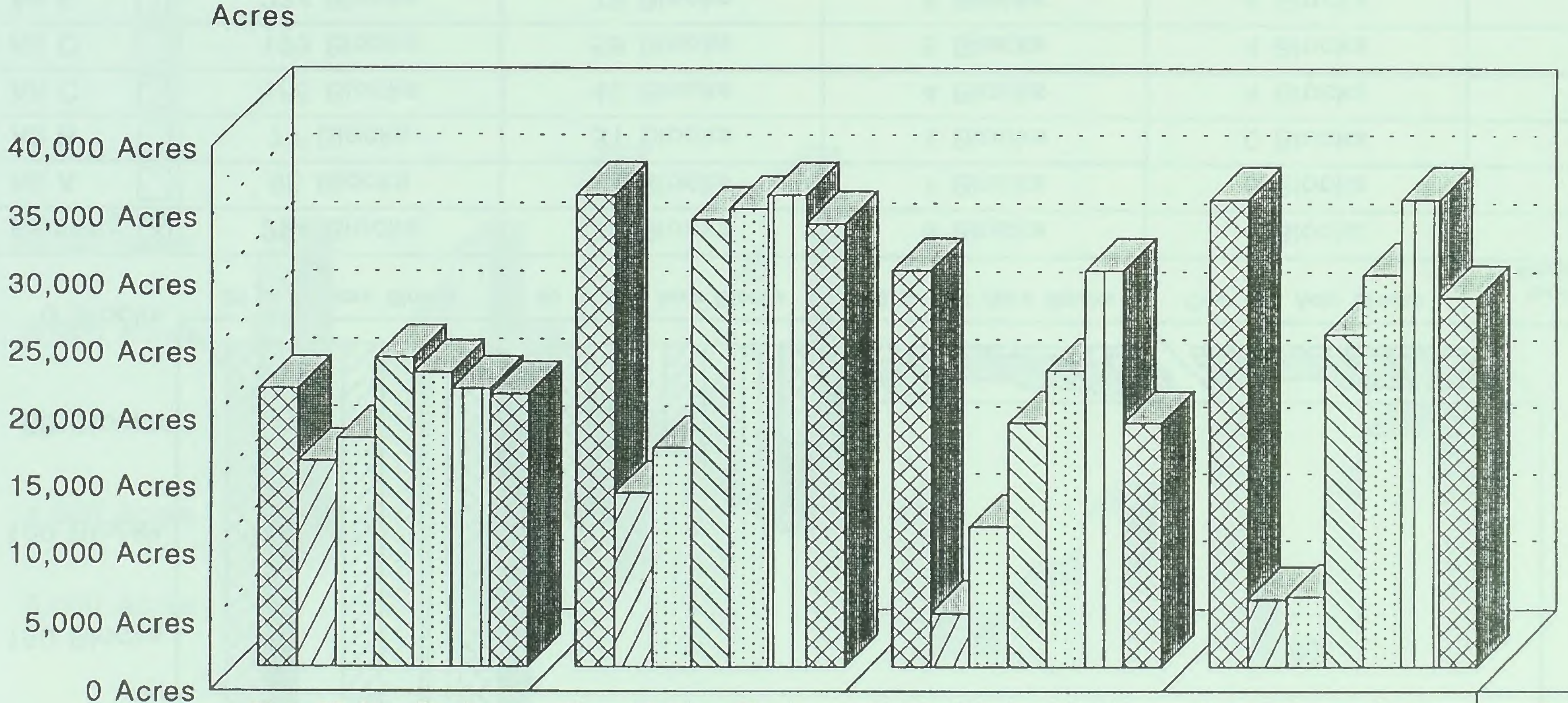
Number of Old Growth Blocks



	20 to 79 Acre Blocks	80 to 299 Acre Blocks	300 to 599 Acre Blocks	Over 600 Acre Blocks	Total Blocks
Existing ▩	510 Blocks	227 Blocks	72 Blocks	20 Blocks	829
Alt A ▨	409 Blocks	96 Blocks	10 Blocks	5 Blocks	520
Alt B ░	444 Blocks	114 Blocks	24 Blocks	5 Blocks	587
Alt C ▧	579 Blocks	218 Blocks	45 Blocks	17 Blocks	859
Alt D ░	543 Blocks	219 Blocks	55 Blocks	19 Blocks	836
Alt E ▥	510 Blocks	227 Blocks	72 Blocks	20 Blocks	829
Alt P ▩	516 Blocks	219 Blocks	45 Blocks	18 Blocks	798

Size Classes

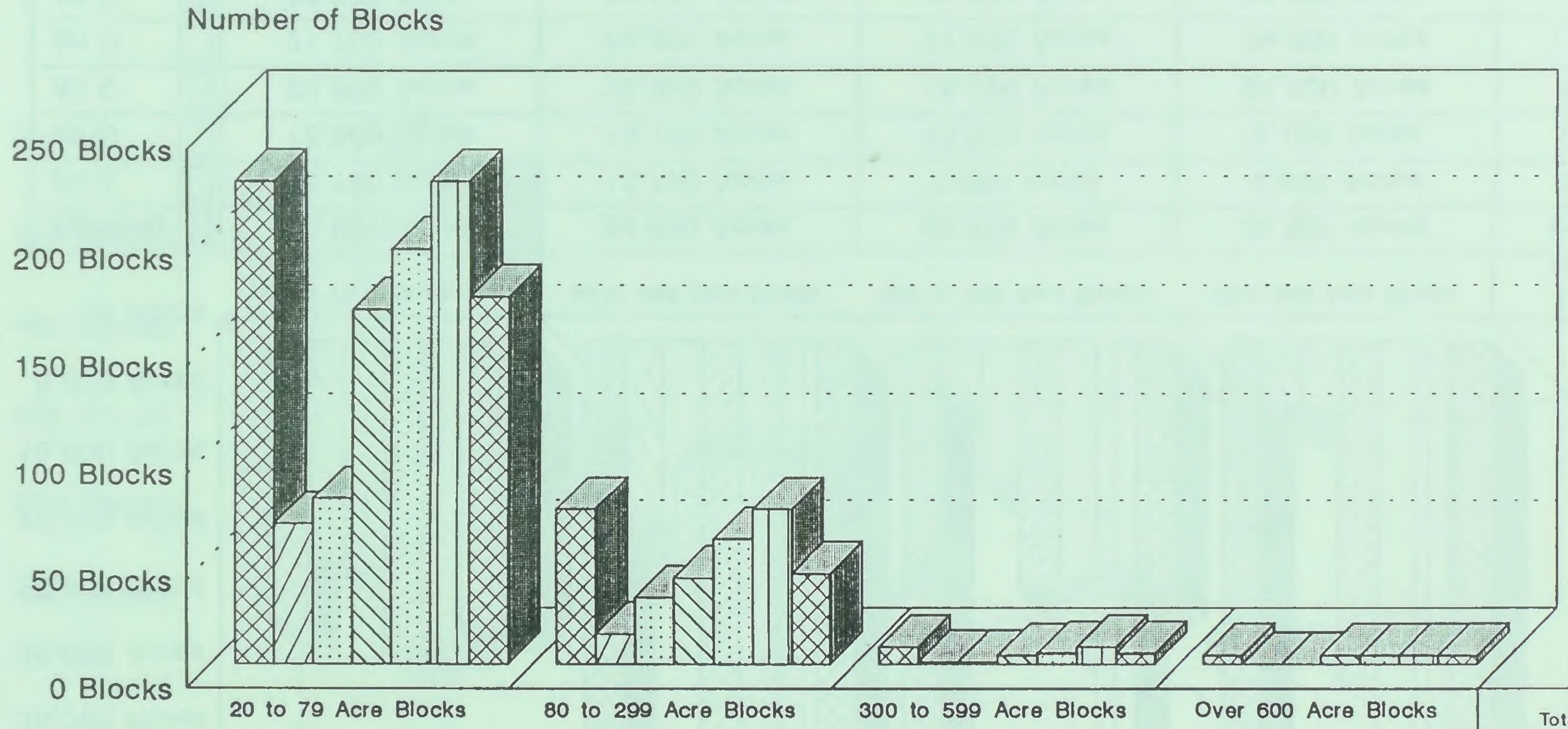
Figure 4-8. Roseburg Ten Year Biodiversity
Total Area of Old Growth Blocks



	20 to 79 Acre Blocks	80 to 299 Acre Blocks	300 to 599 Acre Blocks	Over 600 Acre Blocks	Total Acres
Existing ▩	20,500 Acres	34,800 Acres	29,300 Acres	34,500 Acres	119,100
Alt A ▨	15,100 Acres	12,700 Acres	3,900 Acres	4,900 Acres	36,600
Alt B ⬚	16,800 Acres	16,100 Acres	10,200 Acres	5,100 Acres	48,200
Alt C ▧	22,800 Acres	33,000 Acres	18,000 Acres	24,600 Acres	98,400
Alt D ⬚	21,700 Acres	33,800 Acres	21,900 Acres	29,000 Acres	106,500
Alt E ▯	20,500 Acres	34,800 Acres	29,300 Acres	34,500 Acres	119,100
Alt P ▩	20,100 Acres	32,700 Acres	18,000 Acres	27,300 Acres	98,200

Size Classes

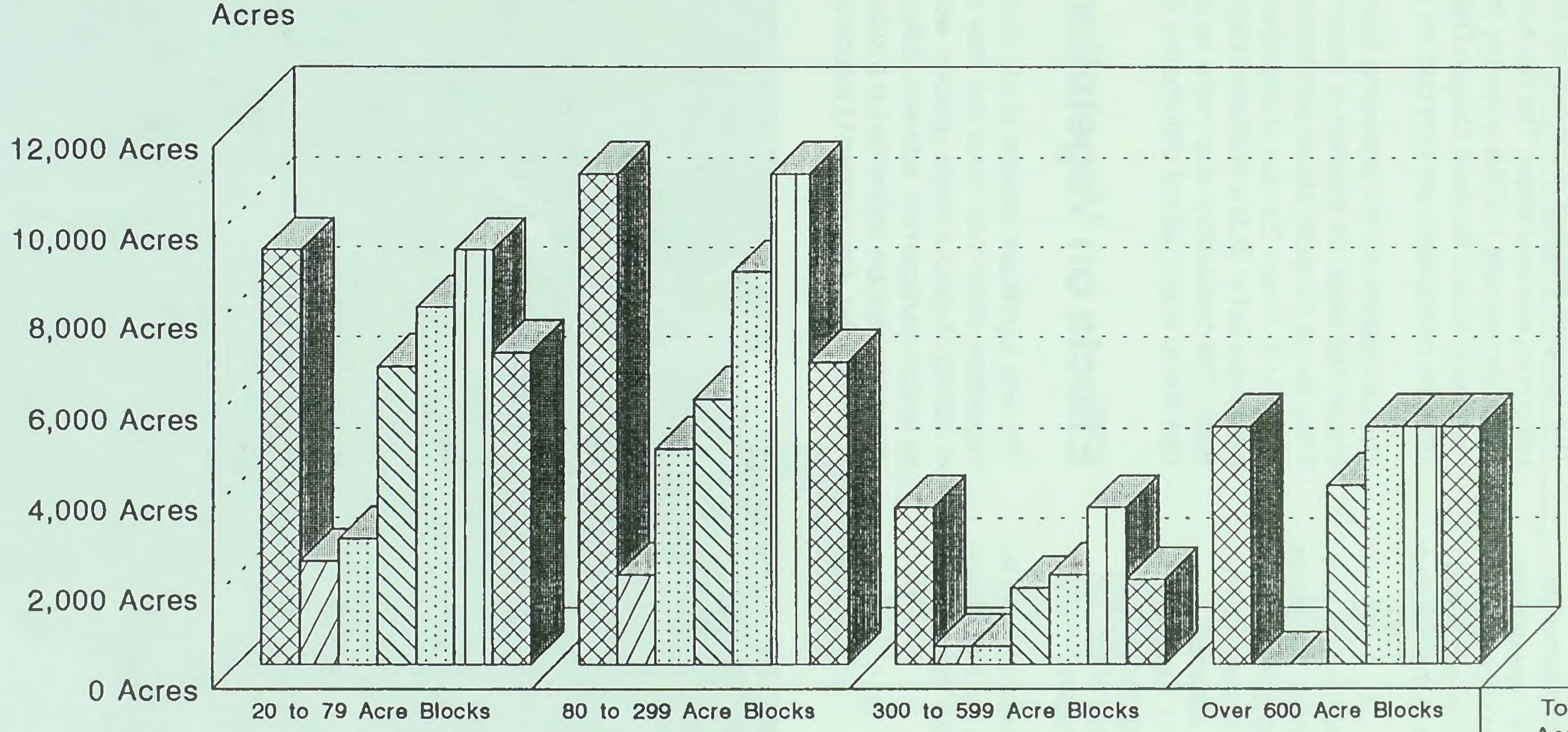
Figure 4-9. Roseburg Ten Year Biodiversity
Number of Interior Old Growth Blocks



	20 to 79 Acre Blocks	80 to 299 Acre Blocks	300 to 599 Acre Blocks	Over 600 Acre Blocks	Total Blocks
Existing ⊠	224 Blocks	72 Blocks	8 Blocks	4 Blocks	308
Alt A ▨	65 Blocks	14 Blocks	1 Blocks	0 Blocks	80
Alt B ⬚	77 Blocks	31 Blocks	1 Blocks	0 Blocks	109
Alt C ▧	165 Blocks	40 Blocks	4 Blocks	4 Blocks	213
Alt D ⬚	193 Blocks	58 Blocks	5 Blocks	4 Blocks	260
Alt E ◫	224 Blocks	72 Blocks	8 Blocks	4 Blocks	308
Alt P ⊠	171 Blocks	42 Blocks	5 Blocks	4 Blocks	222

Size Classes

Figure 4-10. Roseburg Ten Year Biodiversity
Total Area of Interior Old Growth



	20 to 79 Acre Blocks	80 to 299 Acre Blocks	300 to 599 Acre Blocks	Over 600 Acre Blocks	Total Acres
Existing ☒	9,200 Acres	10,900 Acres	3,500 Acres	5,300 Acres	29,000
Alt A ▨	2,300 Acres	2,000 Acres	400 Acres	0 Acres	4,800
Alt B ░	2,800 Acres	4,800 Acres	400 Acres	0 Acres	8,000
Alt C ▧	6,600 Acres	5,900 Acres	1,700 Acres	4,000 Acres	18,300
Alt D ░	7,900 Acres	8,700 Acres	2,000 Acres	5,300 Acres	24,000
Alt E ▥	9,200 Acres	10,900 Acres	3,500 Acres	5,300 Acres	29,000
Alt P ☒	6,900 Acres	6,700 Acres	1,900 Acres	5,300 Acres	20,900

Size Classes

them by connectivety areas and the providing of legacy in the general forest management area. The HCAs under alternative D would provide large blocks of reserved old-growth but would provide weaker connectivity than alternative C and the preferred alternative because of the lack of old-growth habitat between the HCAs. The blocks in alternative B would be well stratified by elevation (tree breeding) zone, but would provide little or no connectivity because of their limited size and scattered distribution.

The distance between old-growth stands, if large, can lead to isolation of some species of animals and plants that rely on these habitats. The resulting inbreeding can reduce the ability of these species to survive. An indicator of spatial fragmentation is the distance between blocks of old growth (age 200+). Figures 4-11 through 4-18 show the numbers of old-growth blocks 80 acres or more within various distances of the nearest other such block for each alternative.

Of particular interest is the distance between blocks in the biological corridors identified during the formulation of alternative C. These distances are also identified in the table and figures. Corridors are generally believed to provide benefits such as enhanced biotic movement (Saunders et al. 1991).

This complex analysis could only be accomplished using computerized maps. The No Action alternative is based on obsolete (1970s) inventory data, which is not mapped in BLM's Western Oregon Digital Data Base. Thus, no conclusions are provided for that alternative.

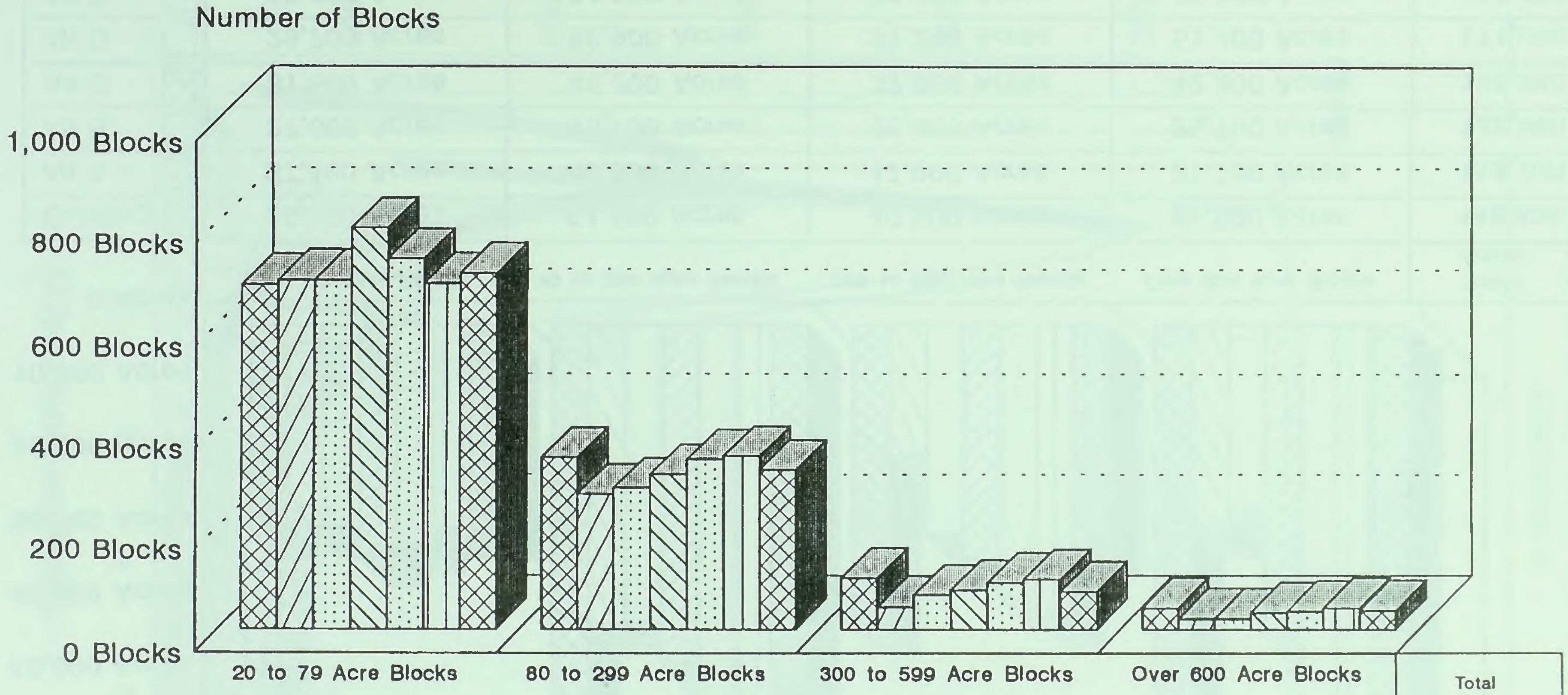
The calculations for the preceding figures consider only blocks that would be retained or restored by BLM. They do not consider blocks administered for retention by the U.S. Forest Service or any other party, as those blocks are not in BLM's Western Oregon Digital Data Base. The calculations also make no allowance for loss due to major natural disturbance events.

Effects on Vegetation

The only significant impacts of the alternatives on vegetation, other than those that may affect the viability of individual special status species, would be caused by timber management activities. Effects on special status species are addressed in a subsequent section of this chapter. Also related to effects on vegetation,

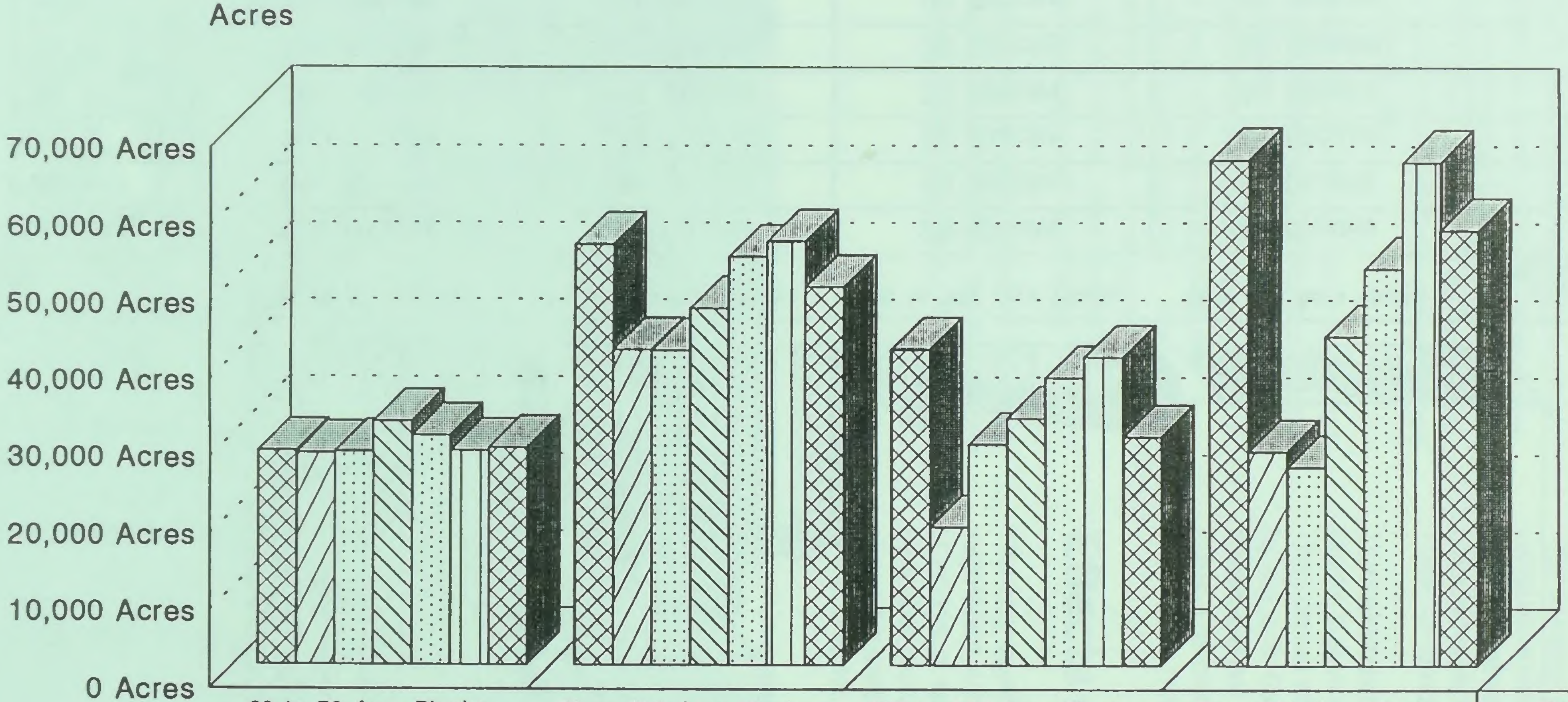
Epiphytic Lichen

Figure 4-11. Roseburg Ten Year Biodiversity
Number of Combined Mature and Old Growth Blocks



	20 to 79 Acre Blocks	80 to 299 Acre Blocks	300 to 599 Acre Blocks	Over 600 Acre Blocks	Total Blocks
Existing ⊠	674 Blocks	339 Blocks	99 Blocks	41 Blocks	1,153
Alt A ▨	683 Blocks	266 Blocks	43 Blocks	20 Blocks	1,012
Alt B ⁙	683 Blocks	278 Blocks	66 Blocks	20 Blocks	1,047
Alt C ▧	786 Blocks	305 Blocks	75 Blocks	32 Blocks	1,198
Alt D ⁙	725 Blocks	335 Blocks	90 Blocks	35 Blocks	1,185
Alt E ◫	677 Blocks	341 Blocks	97 Blocks	41 Blocks	1,156
Alt P ⊠	697 Blocks	314 Blocks	73 Blocks	36 Blocks	1,120

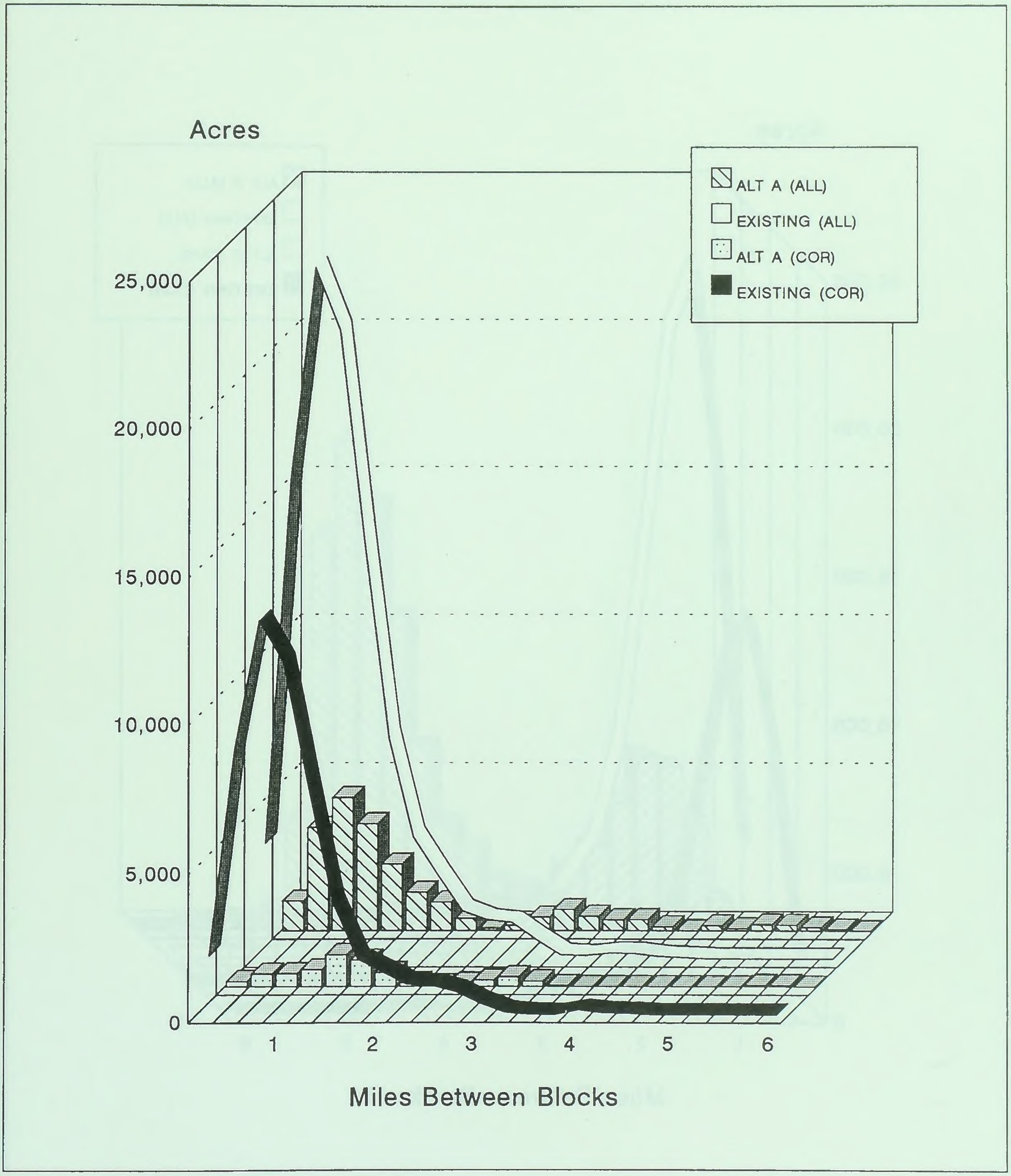
Figure 4-12. Roseburg Ten Year Biodiversity
Total Area of Combined Mature and Old Growth Blocks



	20 to 79 Acre Blocks	80 to 299 Acre Blocks	300 to 599 Acre Blocks	Over 600 Acre Blocks	Total Acres
Existing ⊠	27,700 Acres	54,500 Acres	40,900 Acres	65,500 Acres	188,600
Alt A ▨	27,400 Acres	40,800 Acres	17,900 Acres	27,700 Acres	113,700
Alt B ⬚	27,600 Acres	40,700 Acres	28,600 Acres	25,700 Acres	122,600
Alt C ▧	31,500 Acres	46,200 Acres	32,000 Acres	42,600 Acres	152,200
Alt D ⬚	29,700 Acres	52,900 Acres	37,200 Acres	51,400 Acres	171,200
Alt E ◫	27,700 Acres	54,900 Acres	39,900 Acres	65,200 Acres	187,700
Alt P ⊠	28,100 Acres	49,000 Acres	29,600 Acres	56,400 Acres	163,000

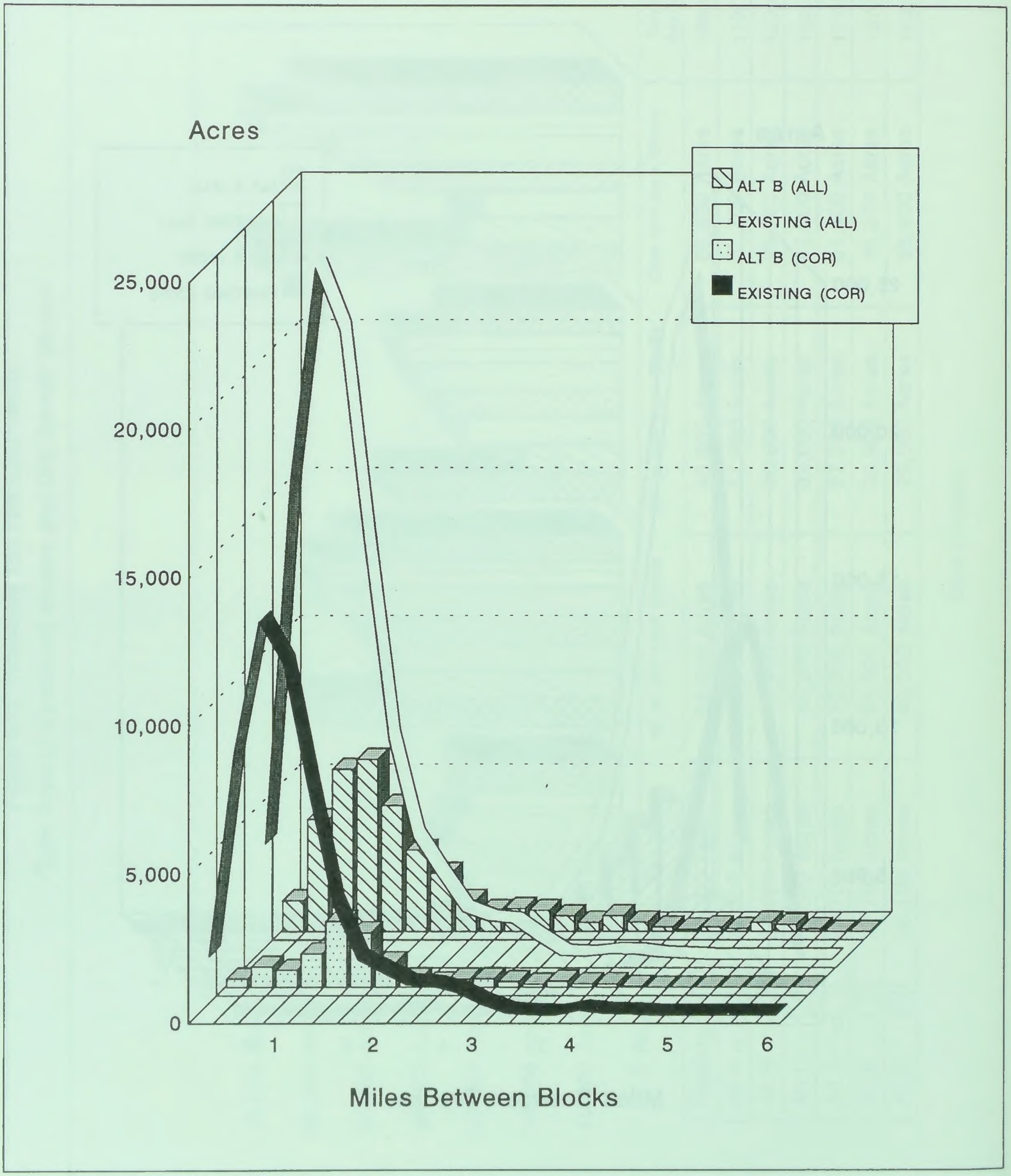
Size Classes

Fig. 4-13. First Decade Changes in Spatial Relationship of Old-Growth Blocks Within Biological Corridors and for the Entire District Alternative A



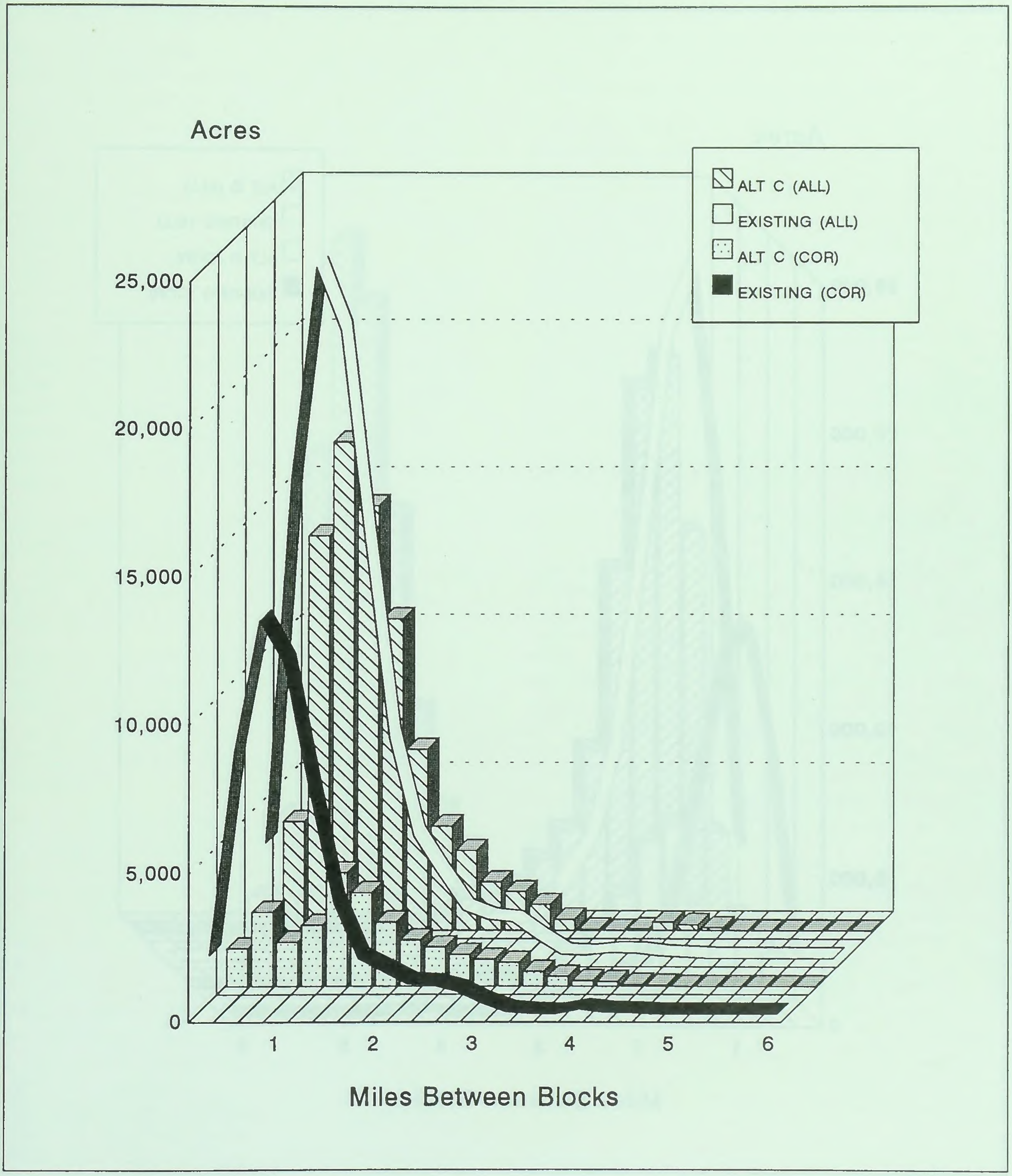
Existing condition in 1990
Alternative A at year 2000

Fig. 4-14. First Decade Changes in Spatial Relationship of Old-Growth Blocks Within Biological Corridors and for the Entire District Alternative B



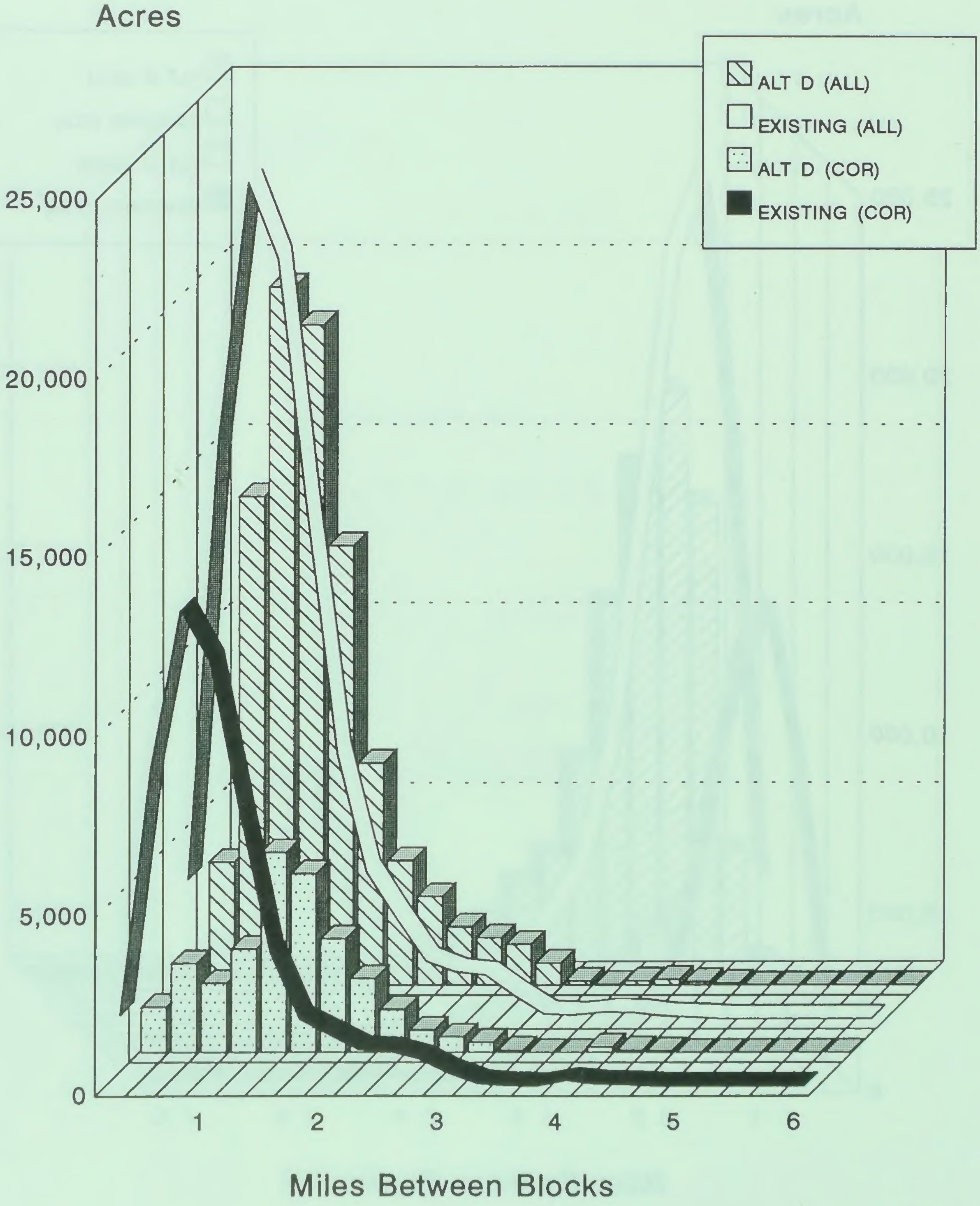
Existing condition in 1990
Alternative B at year 2000

Fig. 4-15. First Decade Changes in Spatial Relationship of Old-Growth Blocks
Within Biological Corridors and for the Entire District
Alternative C



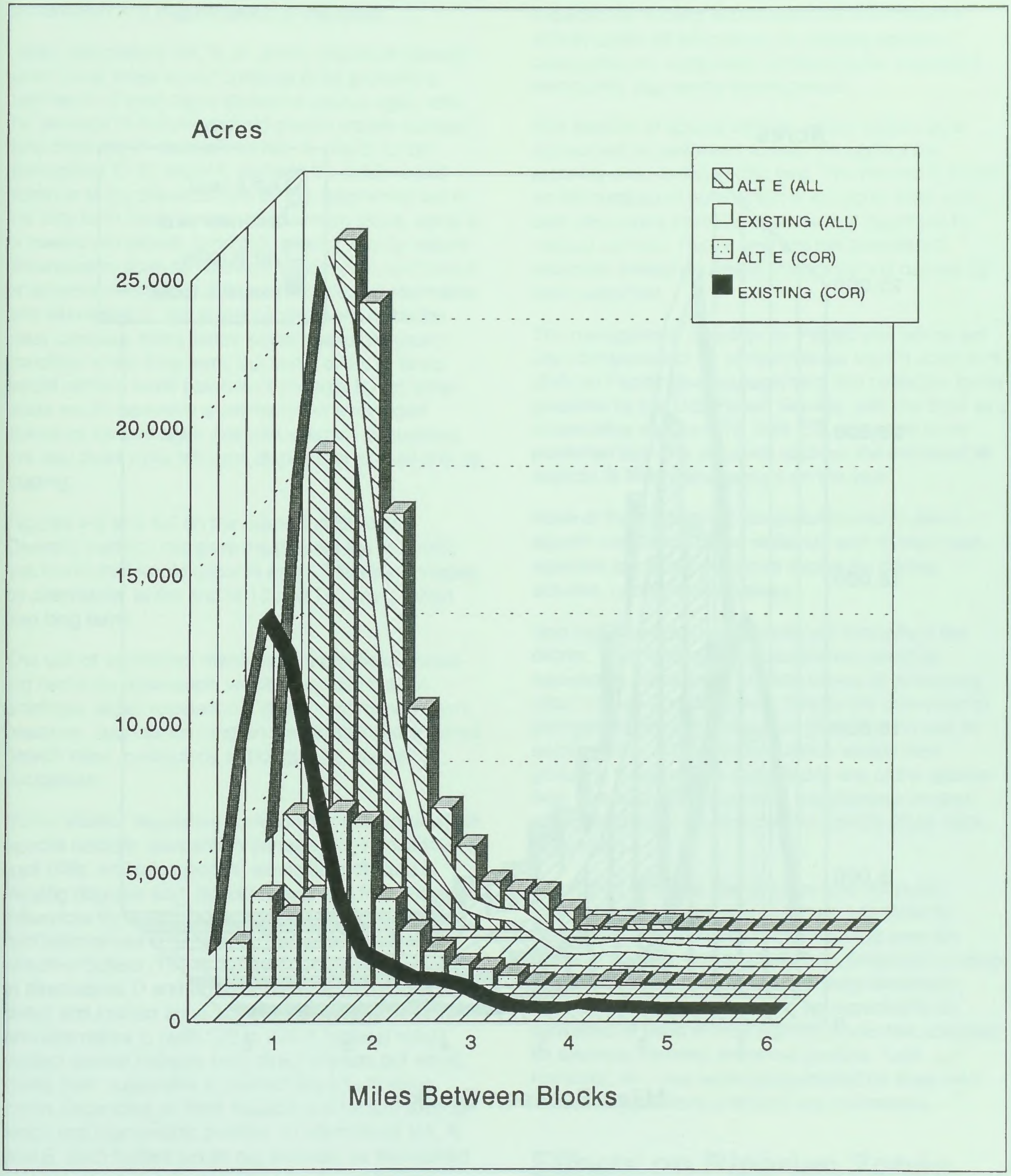
Existing condition in 1990
Alternative C at year 2000

Fig. 4-16. First Decade Changes in Spatial Relationship of Old-Growth Blocks
Within Biological Corridors and for the Entire District
Alternative D



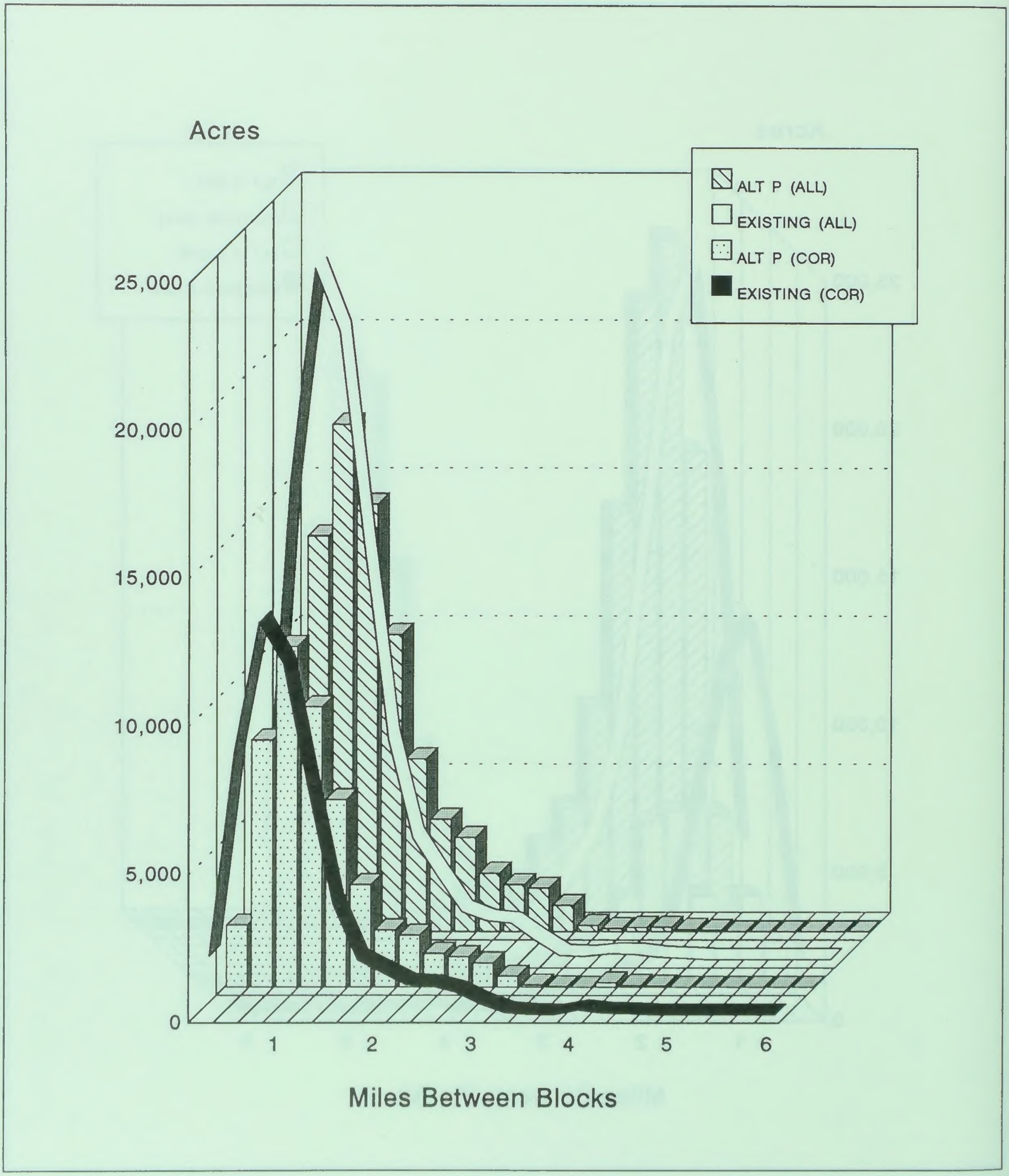
Existing condition in 1990
Alternative D at year 2000

Fig. 4-17. First Decade Changes in Spatial Relationship of Old-Growth Blocks
Within Biological Corridors and for the Entire District
Alternative E



Existing condition in 1990
Alternative E at year 2000

Fig. 4-18. First Decade Changes in Spatial Relationship of Old-Growth Blocks
Within Biological Corridors and for the Entire District
Preferred Alternative



Existing condition in 1990
Preferred Alternative at year 2000

and discussed in other sections of this chapter, are effects on riparian zones and on biological diversity. In the latter section are discussed effects on the structure, composition and fragmentation of the forest.

Under alternatives NA, A, B, and C, the BLM-administered forest lands would continue to be primarily a patchwork of even-aged stands of various ages, with the acreage in mature and old-growth stands substantially declining in alternatives NA, A, and B. Under alternatives D, E, and PA, some of the lands would continue to be characterized by this patchwork, but in the long term many areas would remain intact, aging to or toward old-growth condition, altered only by natural disturbances such as wildfires, windstorms, and insect or disease infestations. Under the preferred alternative and alternative C, the forest condition would be the most complex. Many lands would age to old-growth condition in the long-term, but some of those lands would contain small patches of younger forest; other lands would resemble a patchwork of even-aged stands of various ages, but with a legacy of standing live and dead trees left from stands that existed prior to logging.

Figures 4-5 and 4-6 (in the preceding Biological Diversity section) compare the percentage of coniferous forest that would occur in each of five seral stages, by alternative, at the end of 10 and 100 years (short and long term).

The use of vegetation management practices, including herbicide application, would suppress but not eradicate target vegetation. Other forest management practices, such as thinning and fertilization would affect growth rates, particularly of Douglas-fir, and affect succession.

Some smaller vegetative communities that occur within special habitats (serpentine barrens, bogs, meadows, rock cliffs, and talus slopes) would be protected to varying degrees from direct impacts and from external influences by buffers under the preferred alternative and alternatives C, D, and E. The widest and most effective buffers (100 to 300 feet) would be maintained in alternatives D and E protecting special habitats from direct and indirect impacts. The preferred alternative and alternative C (with 100 to 200 ft. buffers) would protect special habitats from direct impacts but would make them vulnerable to indirect impacts in some cases depending on their location and factors such as slope and topographic position. In alternatives NA, A, and B, such buffers would not normally be maintained and the vegetation communities in special habitats would be vulnerable to incidental disturbance from activities on adjacent lands. Impacts from road construction would be permitted in all alternatives when construction outside a special habitat area would result in greater impacts to other resources. Vegetative communities in special habitats could be adversely impacted by mineral exploration and development activity under all alternatives by altering species composition or completely eliminating the vegetative community (eg. quarry development).

One species of special interest, which occurs as a component of coniferous forests throughout the planning area, is the Pacific yew. The interest is based on the compound taxol which is extracted from yew bark and shows promise as a medical treatment for various cancers. Pacific yew are not considered abundant enough to permit unconstrained harvest for taxol extraction.

The management direction for Pacific yew will be set after completion of an environmental impact statement (EIS) on Pacific yew management and collection being prepared by the U.S. Forest Service, with the BLM as a cooperating agency. The draft EIS, expected to be published later this year, will address the effects of all aspects of BLM management on the yew.

None of the alternatives would substantially affect aquatic vegetation, since wetlands and riparian management areas are protected except for mining activites, under all alternatives.

Non-native species are established throughout the district. Their frequency of occurrence would be expected to increase in all alternatives as previously uncut mature and old-growth forests are converted to younger stands and non-native grasses are used to stabilize soils. Increases in noxious weeds (see glossary) would not be expected in any of the alternatives due to implementation of the intensive control efforts detailed in the Noxious Weed EIS (BLM 1985, BLM 1987).

Vegetation could be altered once land left public ownership as a result of land tenure adjustments. Current private land uses in the planning area are primarily farming, timber production, livestock ranching, and recreation. If transferred to private ownership, BLM-administered lands would be expected to be converted or used to their highest productive potential; for example, farming, improved pasture, rural homesite, etc. Use would be restricted by state laws and local regulations and land use ordinances.

Effects on Riparian Zones

In this analysis of impacts, riparian condition class is primarily related to tree size in the riparian management area (RMA), see Appendix 3-7. Further discussion of RMAs may be found in the Water Resources, Fish, and Wildlife sections of this chapter. In the Riparian and Fish sections of this chapter, 200 years is used for long term analysis.

Existing mining laws allow mining activities in RMAs that could have adverse impacts under all alternatives. These laws require that mitigating measures be taken for any adverse impacts associated with mining. Roads exist along many streams and adversely impact riparian and stream conditions through canopy removal, soil compaction, erosion and sediment deposition, soil compaction, and culvert placement. New roads would no longer be built in valley bottom riparian areas. See Table 4-1 for miles of roads that would be constructed under the alternatives. New roads would mostly be higher in the watersheds crossing steeper side slopes, and smaller first and second order streams. There would be minor short and long term impacts associated with this construction (canopy removal, soil compaction, erosion) that would have minimal adverse impacts on small riparian areas. There would be a potential for adverse impacts to riparian zones due to the risk of road failures in these steeper areas. Impacts to riparian areas from recreational activities would be insignificant both in the short and long term across the district. Although minimal, there would be adverse impacts from campground use, campground construction, increased boating, boat ramp construction, and ORV use which would include soil compaction, canopy removal, erosion, streambank degredation, stream sedimentation, and wildlife disturbance.

On BLM-administered lands, all alternatives except NA and A provide for the adequate protection of wet meadows, wetlands, ponds, and lakes except from mining activity. A riparian zone can be in optimal condition based on riparian tree size, but still not be in a functionally optimal condition. The width of a riparian protection area determines the potential amount of large woody debris in a stream channel. A 94 foot retained width on each side is capable of providing most of the necessary large woody debris (Murphy and Koski, 1989), and a retained width of 164 feet on each side is capable of providing an optimum amount of large woody debris (Van Sickle and Gregory). Within old-growth conifer forests, 98 percent of the large woody debris comes from within 150 feet of the stream (McDade et al. 1990). Logging impacts to aquatic benthic invertebrates were detected in streams with buffer widths of less than approximately 30 meters (98 feet) (Erman et al. 1977). RMAs of less than approximately 95 feet are considered inadequate for proper riparian function, and RMAs smaller than 150 feet are considered to be functioning less than optimally.

The effects of the alternatives on existing stream riparian zone conditions would vary depending upon the width of riparian management areas and the amount of vegetative disturbance occuring in those areas. Riparian conditions for third order and larger streams by riparian zone condition class are shown in Table 4-9 for alternative B. This is representative of all the alternatives except A (i.e. conditions improve from existing to short term and long term), although the total acreage is different for each alternative. RMA width under alternatives NA and A would not provide sufficient natural input of large woody debris to streams. An overall improvement to riparian protection is expected with additional protection provided to the important small first and second order drainages that were unprotected under the NA alternative. Under all alternatives, RMAs averaging 75 feet (minimum 50 feet) would be established on each side of first and second order perennial streams, as well as a 25 foot brush, and hardwood vegetative strip on each side of intermittant streams.

In the short term and long term under all alternatives except NA which does not protect first and second order streams, conditions within the riparian zone would improve with the RMA protection which allows an increasing diversity and maturity of the riparian zone. At the end of the short term (10 years), 31 percent of the riparian acres along third order and larger streams riparian acres would be in minimal condition (Classes 1 and 2), 9 percent in fair condition (Class 3), and 60 percent in good/optimal condition (Class 4).

At the end of the long term (200 years) conditions would be good /optimal in 80 percent of the riparian areas. Conditions in the remaining 20 percent would be fair due to existing roads in the riparian (approximately 15 percent) and landslides, fires, etc. that would affect riparian zones. Data is not available for first and second order stream riparian zones. The majority of these streams have not been protected in the past, and a significant portion of these are expected to be in minimal condition. In the short term, riparian conditions would be expected to remain in minimal (class 2) and fair (class 3) conditions.

Alternative A would have 16,886 acres in RMAs for third order and larger streams. This is less than all other alternatives. Alternative A would have the highest amount of site disturbing activities including timber harvest and road construction along with the expected accompanying sedimentation. Cumulative impacts would be greatest under alternative A. Narrow RMA widths under alternative A would not provide sufficient large woody debris and standing snags for riparian dependent wildlife, or thermal microhabitat protection for riparian dependent species under alterantive A. At the end of the short term, conditions within the protected zone would remain the same or improve slightly compared to present for all streams due to the protection offered first and second order streams. Long term riparian conditions for all perennial streams would be expected to be fair because of the RMA widths less than 95 feet. First and second order intermittant streams would receive a 25 foot protective brush strip with timber harvest occuring throughout their drainage and would be in minimal condition for the first 40 years after harvest, recovering to fair condition until the area is harvested again.

Alternative B would have 18,220 acres in RMAs for third order and larger streams which is more than alternative NA and A, but less than alternative C, D, E, and PA. Cumulative impacts would be higher than alternatives C, D, E, and PA. RMA widths in most cases would provide most but not the optimum number of snags and down wood necessary to maintain the riparian ecosystem. At the end of the short term, as compared to present, conditions within the protected riparian zone would improve slightly for all streams with the added protection to first and second order streams. Long term conditions for fifth order and larger RMAs are expected to reach 80 percent good/optimal and 20 percent fair due to roads, landslides and fire in the riparian areas. First through fourth order perennial RMAs are expected to reach fair condition because of inadequate RMA widths. First and second order intermittant riparian conditions would be minimal for the first 40 years after harvest and fair until the area is harvested again.

Alternative C would have 29,308 acres in RMAs for third order and larger streams. Considerably more riparian protection is afforded under this alternative than alternatives NA, A, and B. Road construction is a 1/3 of that under alternatives NA, A, and B. Silvicultural prescriptions would provide for retention of live trees on all harvest units which would slightly lessen the intensity of peak flows within watersheds. At the end of the short term, conditions within the protected riparian zone would improve for all streams. Long term conditions for third order and larger streams would be expected to reach 80 percent good/optimal and 20 percent fair. First and second order perennial riparian zones would reach fair condition with the insufficient RMA widths. First and second order intermittant streams would be in minimal condition for the first 40 years after harvest and would recover to fair until the area is harvested again. The recovered period is longer under alternatives C and PA than NA, A, B, D, and E because of an extended rotation. Most of the needed large wood input for proper stream function would occur in first through fourth order perennial streams, and optimum amount would be available for fifth order and larger streams.

Alternative D would have 52,282 acres in RMAs for third order and larger streams. Although the timber harvest level under this alternative is higher than alternative C (see Table 2-1), site disturbing activities are generally less than alternatives NA, A, B, and C. Second order intermittant streams would receive RMA protection of 60 feet on each side. At the end of the short term, riparian conditions would improve for all streams more than alternatives NA, A, B, and C, due to the added protection to second order intermittant streams. Long term conditions for third order and larger streams would be expected to reach 80 percent good/optimal and 20 percent fair. First and second order perennial and second order intermittant riparian zones would reach fair condition because of the narrow widths. First order intermittant streams would be in minimal condition for the first 40 years after harvest and fair until the area is harvested again.

Alternative E would have 61,764 acres in RMAs for third order and larger streams, the largest of all alternatives. Site disturbing activities, including timber harvest and road construction would be the lowest compared to all other alternatives. First order intermittant streams would receive RMA protection under this alternative. At the end of the short term, riparian conditions for all streams would improve the most compared to all other alternatives. Long term conditions for third order and larger streams are expected to reach 80 percent good/optimal and 20 percent fair. All first and second order riparian zones would reach fair condition under this alternative. No riparian areas would be in minimal condition under this alternative.

The preferred alternative has 34,576 acres in RMAs for third order and larger streams. Under the preferred alternative all fish bearing streams, receive at least a 150 foot RMA on each side. At the end of the short term, conditions within the protected riparian zone would improve for all streams. Long term conditions for 80 percent of all fish bearing streams, regardless of order, would reach good/optimal condition. The other 20 percent are those affected by roads, landslides, fires, etc. in the riparian area. For all non-fish bearing streams in OGEAs where the harvest rotation is 300 years, expected conditions would reach good/optimal except where affected by roads, fires, or landslides. Non-fish bearing streams in connectivity areas and the general forest management areas would recover to good/optimal condition (80 percent) and fair (20 percent) for third order and larger streams, and to fair condition in first and second order perennial streams due to the inadequate RMA width. First and second order intermittant streams would recover to minimal conditions for the first 40 years after harvest and fair until the area is harvested again. Cumulative impacts, would vary under the differing treatments of this alternative. Cumulative impacts in OGEAs would be minimal with the deferral of regeneration harvests for 80 years in addition to high retention of trees in harvest units, small harvest openings, and a 300 year rotation. The retention of 12 to 16 trees per acre in the connectivity areas would reduce peak flows by retaining more canopy cover as compared to alternatives NA, A, B, and D. Within the General Forest Management Area (GFMA) the retention of six to eight trees per acre on harvest units would reduce the cummulative impacts to less than those under alternatives NA, A, and B.

Overall, the adverse impacts to riparian zones associated with management would vary from the most to the least under the alternatives in the following order; NA, A, B, C, D/PA, E. The differences in protection from adverse impacts between alternatives D and PA are negligible.

Effects on Wildlife

Introduction

Habitat indices were calculated for some priority habitats and species for the existing condition and alternatives by use of habitat models (USDI BLM 1991). Several of these models have been previously published; for example, elk (Wisdom et al. 1986) and cavity dwellers (Brown 1985). Others were derived by BLM biologists and planners specifically for this and other western Oregon BLM EISs. Indices derived under the various models predict such factors as the amount, quality, and distribution of habitat. The assumptions and analytical approaches for each model are found in Appendix 4-7 (which displays the wildlife analytical techniques described in State Director Guidance). In cases where habitat models were unavailable or were not derived, analysis of impacts was based on literature references, personal communications with experts, and professional judgement.

Impacts on Habitat

Timber management affects wildlife primarily by modifying habitat. Thomas (1979) and Brown (1985) indicated that certain wildlife species are associated with forests of a particular age class and structure. The close affinity of wildlife for specific habitat conditions underscores the importance of analyzing impacts of forest harvesting on habitat composition.

Roads have major impacts on wildlife habitat by direct elimination of vegetation within rights-of-way (BLM roads and private roads constructed under permits and reciprocal rights-of-way agreements) and by disturbance of wildlife caused by increased human access. Big game species are especially vulnerable to these road impacts (Brown 1985). Road construction resulting from intensive timber management under all alternatives would have an adverse effect on wildlife habitat. Miles of new roads constructed (less miles of roads to be closed) in the short term would be highest under alternatives NA, A, and B, compared to alternatives C, D, E, and PA. Impacts of new roads would not be uniformally distributed across the landscape in alternatives C, D, and PA. Blocks withdrawn or deferred from timber harvest, such as Restoration and Retention blocks (R and R), HCAs, and OGEAs would be expected to be impacted only slightly from new roads.

Assessment of impacts on habitat is based on the expected availability of forest seral stages, special habitats, and riparian habitats under each alternative in relation to the existing condition. Also related to effects on wildlife, and discussed in previous and subsequent sections are effects on vegetation and biological diversity (including discussions of dead and downed wood and hardwoods). Effects on special status species including northern spotted owls are addressed in the Special Status Species section of this chapter.

Conifer forests

Conifer forests comprise the dominant habitat within the district, currently comprising about 97 percent of BLM-administered land. Habitat composition under the various alternatives is displayed in the discussions of Effects on Vegetation and Biological Diversity.

The current age class distribution in the district is bimodal with a preponderance of younger and older age classes and few in the mid age classes.

Maintenance of the older stands would continue the existing abundance and distribution of wildlife species preferring mature and old-growth habitat (see Appendix 3-8 for a list of these species). Alternative E is the only alternative which would completely provide for this in the short term. Alternatives C, D, and E retain significant amounts of mature and old-growth habitat and allow the development of additional acres within certain management regimes. Under alternatives NA, A, and B most of the remaining old-growth would be harvested in the long term and significantly reduced in the short term. The amount of old-growth habitat remaining in the short and long term for all alternatives is shown in the biological diversity section of this chapter. Populations of species preferring early seral stages would decline under alternatives D, E, and PA. In the short-term under alternative C, populations of older forest dependent species would decline from their current level while populations of species preferring younger forests would remain high. Populations of old-growth dependent species would recover sooner under high retention prescriptions of alternative C than under traditional clearcutting. In the long-term, alternative C would likely provide for moderate levels of both old-growth species and species preferring early seral stages as compared to alternatives A, B, D, and E which would favor one or the other. These effects would result from the maintenance of some older forest habitat elements within the framework of a younger forest. The application of alternatives C and PA

Table 4-9. Estimated condition of riparian zones [4]

Acres of each condition class[1] by stream order

Stream Order	Existing Condition 1 min.	2 min.	3 fair	4 good+	Short Term[2] 1 min.	2 min.	3 fair	4 good+
3	2,370	630	660	4,600	240	2,510	750	4,760
4	1,290	390	370	3,100	130	1,400	430	3,190
5	760	330	150	1,790	80	880	240	1,830
6	210	130	70	740	20	270	100	760
7	90	30	10	370	10	100	20	370
8	10	10	10	20	0	20	10	20
9	0	0	0	80	0	0	0	80
Total	4,730	1,520	1,270	10,700	480	5,180	1,550	11,010

Stream Order	Long Term 1 min.	2 min.	3 fair	4 good+
3	200	210	1,240	6,610
4	130	130	770	4,120
5	70	80	460	2,420
6	30	30	170	920
7	10	10	80	400
8	0	0	10	40
9	0	0	10	70
Total	440	460	2,740	14,580

[1] Riparian condition class equates to size of trees (dbh) in riparian zones:

Class 1 (minimal condition)	=	0-5 inch trees
Class 2 (minimal condition)	=	5-11 inch trees
Class 3 (fair condition)	=	11-21 inch trees
Class 4 (good/optimal condition)	=	21 inch plus trees

[2] End of short term (10 years). Estimated changes from existing conditions:
85 percent of class 1 goes to class 2
85 percent of class 2 goes to class 3
20 percent of class 3 goes to class 4

[3] End of long term (200 years); does not include alternative A. Estimated changes from existing conditions:
2 percent of total remains in class 1
3 percent of total remains in class 2
15 percent of total remains in class 3

Source: District timber inventory.

[4] Data shown is for alternative B. This is representative of all the alernatives except A, although the total acreage would be different for each alternative.

management to the forest land base is untested, and responses of animals to this management approach are not well documented.

The preferred alternative would favor old-growth species within OGEAs, and early to mid successional species in the GFMA while retaining legacies of old-growth components. Habitat for early successional species would be favored in the connectivity areas in the short term. In the long term, connectivity areas would consist of 25 to 33 percent old-growth habitat in a spatially well distributed pattern to favor species movement. Cumulative long term effects resulting from activities on BLM-administered land and actions on other lands (i.e., private and other public lands) would be detrimental to older forest habitat and species requiring old-growth and mature habitats under alternatives NA, A, and B. Reductions in mature and old-growth habitat would be an unavoidable adverse impact. Widespread clearcutting on private lands in conjunction with harvest rates on public lands has led to a skewed distribution with younger age classes predominating throughout western Oregon (ODF 1990). This cumulative effect and the probability of continuation of such timber harvest practices on most private lands magnify the importance of mature and old-growth habitat on public land as a relatively scarce habitat on a regional basis. Alternative C would maintain intermediate levels of existing old-growth and would permit some younger stands located within designated Retention and Restoration blocks and other areas excluded from timber harvest to age toward old-growth. Alternative E would maintain current levels of older forest as well as allowing some younger stands (which are left as buffers around 150 year-old plus stands or excluded from timber harvest for other reasons) to age toward an older forest condition. The preferred alternative would maintain old-growth conditions in OGEAs (300 year rotation with high retention regeneration harvest prescriptions) as well as restoring old-growth conditions to younger stands in OGEAs. Connectivity areas would be managed to retain 25 to 33 percent of the land area in spatially well distributed old-growth stands (150 year rotation, retain 12 to 16 trees per acre in regeneration harvests). Alternatives D and PA would maintain large blocks of old-growth forest and provide for young forests within these blocks to age toward old-growth conditions. Alternatives D and PA would provide a network of small (80 to 100 acres) mature or old-growth units outside the large HCAs or OGEAs that would be retained through the short term.

Special Habitats

The primary resource feature in special habitats (bogs, meadows, rock cliffs, talus slopes, serpentine barrens, etc.) would be partially protected under each alternative. Although the feature itself would be physically protected, maintaining environmental conditions through buffering would vary by alternative. Intact forest buffers do not currently exist around some of these habitats. Alternatives NA, A, and B do not afford buffer protection for special habitats, whereas protected buffer areas under alternatives C through E and the preferred alternative would range from 100 feet to 300 feet.

Buffering of special habitats would help maintain the desired habitat components (e.g., ecologically diverse habitat including ecotones; favorable microclimates) important to a diverse array of wildlife species that inhabit these areas (see Appendix 3-8 for a list of these species). Studies in the Salem District determined that removal of tree cover along edges of small meadows reduced bird population density and resulted in changes in bird species composition (Monthey 1983). The preferred alternative would maintain the physical integrity of special habitat.

Riparian

Riparian habitat functions as a special habitat feature for many wildlife species. The impacts and overall trends for riparian habitat are discussed in the riparian section of this chapter. As riparian habitat stabilizes and matures, the large number (75 percent) of terrestrial birds and animals dependent on riparian habitat will benefit. Amphibians (frogs and salamanders), beaver, mink, otter, waterfowl, kingfish, and several bats are examples of animals which would benefit the most. These animals are highly dependent on the amount and condition of riparian habitat for all or portions of their life cycles.

Impacts on Priority Species

Elk

Assessment of impacts to elk habitat on BLM-administered land was based on a modification of the elk habitat effectiveness model developed by Wisdom et al. (1986) (see Appendix 4-7). Indices are on a scale of 0 to 1.0 with 1.0 representing optimal. The Wisdom Model was modified by dropping the spacing index and by presenting values for each index rather than producing a composite score for all indices. This modification was agreed to by the Oregon Department of Fish and Wildlife. Because the model has not been validated, its predictive capability is uncertain.

Although specific management practices have been identified under each alternative, the timber harvest prescriptions and associated roading would have the most effects or impacts.

The current road densities in all elk management areas result in indexes which fall short of the ODFW recommended criteria of .50. The current road indices by elk management areas and the predicted short term trend are shown in Table 4-10. In the short term alternatives NA, A, and B would result in a continual decline in the index as road densities increase. Under alternative B, two units are an exception to this trend as road closures on existing roads and restrictions on new roads remaining open would minimize increases in road densities. Alternatives C, D, E, and PA would vary by elk management unit and reflect road closures for recreation and elk management and timber harvest emphasis by alternative. The elk managment areas containing OGEAs, R and R blocks, or HCAs would have few new roads resulting in a stable or improving condition.

The cover index reflects the quality of cover habitat and not the quantity. Optimal cover is rated most effective (a value of 1.0) while hiding cover (0.1) is least effective. The higher the index, the more optimal and thermal cover exists in relation to hiding cover. Current cover indexes are presented in Table 4-11. The ODFW criteria recommends an index of .40 or higher. Alternatives NA, A, and B would reduce optimal and thermal cover across the landscape resulting in declining cover conditions and indices. Cover indices would improve or remain constant in elk areas containing R and R blocks and in areas managed under the high retention silvicultural prescription of alternative C. Elk managment areas containing HCAs would improve as the forest aged while elk management areas not containing HCAs would see optimal cover lost with eventual increases in hiding cover. The PA is similar to alternative D, except that longer harvest rotation in connectivity areas of the PA would result in higher cover indices in the long term. In the short term, cover would decline within connectivity areas and the GFMA. Management within the OGEAs would result in an improving index. Alternative E would result in improved cover across the district as the majority of forest stands moved toward old-growth conditions. On BLM-administered lands, the overall pattern would be for cover and road density condition to improve in a similar manner while forage indices would respond contrarily. Cumulative effects of combining activities on BLM-administered lands would result in improvement in elk habitat and numbers for those alternatives favoring improved cover and reduced road densities. Forage areas and hiding cover would be available on private lands, therefore high cover indexes and lower road densities on BLM-administered lands would be complementary for overall management of elk populations.

The forage index is a measure of the quality of forage habitat and not an indicator of quantity. All regeneration harvest units are considered foraging habitat for the first twenty years. Lands allocated for timber production under each alternative would have a positive effect on the forage index. Regeneration harvest combined with slash burning would result in higher indices than currently exist (see Table 4-12). Under alternatives NA, A, B, D, E, and the GFMA in the preferred alternative where timber harvest occurs, the emphasis would be on timber production. This emphasis would limit forage seeding and fertilization on drier sites where vegetative competition is more likely to effect tree seedling survival. Alternatives NA, A, and B would provide the highest forage indices over the greatest area. Forage indices would also improve on lands allocated for intensive timber management under alternatives D, E, and PA. Green tree retention prescriptions under alternatives C and PA would result in lower indices as broadcast burning of logging slash would occur less frequently. In the long term, the greater emphasis an alternative places on old-growth management, the lower the forage habitat and forage index would be.

Alternatives C, D, E, and PA for those elk management areas containing constraints or deferral of timber harvest would provide the most effective short term and long term elk habitat management. For the short term, under the preferred alternative 150,000 acres would improve in overall quality as elk habitat, while 266,000 acres would decline in overall quality as cover and road density indices decline.

Cumulative effects of combined activities on BLM-administered lands and actions on other lands in the planning area are expected to result in a decline in elk habitat quality and in numbers of elk under alternatives NA, A, and B. This expected decline is due to anticipated high levels of road construction and lower levels of thermal and optimal cover. An improvement in habitat quality and elk numbers is anticipated under alternative E despite less than optimal conditions on private lands. Elk managment areas that coincide with areas allocated for old-growth management under alternatives C, D, and PA would improve. Elk habitat on private lands primarily consists of younger seral stages which provide abundant forage and currently increasing amounts of thermal cover, but very limited amounts of optimal cover. In addition, road densities are often high on private lands, and clearcuts are

Table 4-10. Assessments of short-term impacts on elk habitat in the planning area, road indices.

Elk Management Areas	Existing Condition		Predicted Change After Ten Years By Alternative[1]						
	Rd Den[2]	HE_r	NA	A	B	C	D	E	PA
CEEL 01 Gunter	3.9	.27	-	-	-	0	0	0	0
CEEL 02 Smith River*	3.6	.31	-	-	-	0	0	0	0
CEEL 03 Tom Folley	3.8	.29	-	-	-	0	0	0	0
CEEL 04 Green Ridge	4.0	.26	-	-	-	-	-	0	-
CEEL 05 Yellow Butte	4.2	.25	-	-	-	-	-	0	-
CEEL 06 Tyee*	3.7	.30	-	-	+	+	+	+	+
CEEL 07 Ben More	4.4	.22	-	-	-	-	-	0	-
CEEL 08 Tyee Mtn.	4.8	.17	-	-	-	-	-	0	-
CEEL 09 Camp Cr.*	3.7	.30	-	-	+	+	+	+	+
CEEL 10 Middle Mtn.	5.7	.08	-	-	-	+	+	+	+
CEEL 11 Rock Cr.*	4.8	.18	-	-	-	+	+	+	+
CEEL 12 Little River	4.1	.25	-	-	-	0	0	0	0
CEEL 13 White Rock	4.0	.27	-	-	-	0	0	0	0
CEEL 14 Myrtle Cr.	4.1	.25	-	-	-	-	-	0	-
CEEL 15 Deadman Mtn.	3.9	.27	-	-	-	+	+	+	-
CEEL 16 Camas Valley	4.7	.19	-	-	-	-	-	0	-
CEEL 17 W.F. Cow Cr.*	4.7	.19	-	-	-	0	0	0	0
CEEL 18 Twelve Mile*	5.3	.13	-	-	-	0	0	0	0
CEEL 19 Middle Cr.*	5.3	.12	-	-	-	0	0	0	0
CEEL 20 Hyde Ridge*	4.2	.25	-	-	-	+	+	+	+
CEEL 21 Green Butte*	3.8	.28	-	-	-	+	+	+	+
	Avg.	.23							

* = OGEA

[1] Ratings for road density (HE_r), cover (HE_c) and forge (HE_f) ratios based on projected increases or decreases from existing condition. (See Appendix 4-7.)

- = Declining condition relative to existing condition.

0 = No change.

+ = Improving condition.

[2] Calculated for BLM and non-BLM-administered lands within elk management areas with greater than 25 percent BLM-administered land.

usually large, resulting in reduced availability of forage/cover edge habitat. Forage habitat would likely be available for elk using cover on BLM-administered lands under all alternatives because of intensive timber harvest on adjacent private lands.

Cavity Users

Within the planning area, dominant woodpeckers include the Hairy, Downy, and Pileated woodpeckers, the Northern Flicker, and the Red-breasted sapsucker. All depend on excavating nest cavities in dead or live trees with dead tops or branches. The Downy and Pileated woodpeckers require these nest snags to be located within forested stands. The other species may nest in snags in more open habitats.

Impacts to these species under the alternatives would depend on the number, size, and condition of the retained snags and trees, the changes in these snags over time, and the habitat conditions in which they occur. The presence of snags to satisfy woodpecker requirements is also an indicator of the suitability of habitat for other cavity dependent species. Species of special interest within this group include the western bluebird, purple martin, northern flying squirrel, and several bat species. The target population levels for the

Table 4-11. Assessments of short-term impacts on elk habitat in the planning area.

Elk Management Areas	Existing Condition[2]	Predicted Change After Ten Years By Alternative[1]						
	HE_c [3]	NA	A	B	C	D	E	PA
CEEL 01 Gunter	.31	-	-	-	0	+	+	+
CEEL 02 Smith River	.26	-	-	-	+	+	+	+
CEEL 03 Tom Folley	.37	-	-	-	0	+	+	+
CEEL 04 Green Ridge	.29	-	-	-	-	-	+	-
CEEL 05 Yellow Butte	.31	-	-	-	0	-	+	-
CEEL 06 Tyee .41	-	-	-	+	+	+	+	
CEEL 07 Ben More	.45	-	-	-	-	-	+	-
CEEL 08 Tyee Mtn.	.29	-	-	-	0	-	+	-
CEEL 09 Camp Cr.	.24	-	-	-	0	+	+	+
CEEL 10 Middle Mtn.	.56	-	-	-	0	-	+	-
CEEL 11 Rock Cr.	.31	-	-	-	0	+	+	+
CEEL 12 Little River	.32	-	-	-	0	-	+	-
CEEL 13 White Rock	.44	-	-	-	0	-	+	-
CEEL 14 Myrtle Cr.	.29	-	-	-	-	-	+	-
CEEL 15 Deadman Mtn.	.44	-	-	-	0	-	+	-
CEEL 16 Camas Valley	.24	-	-	-	-	-	+	-
CEEL 17 W.F. Cow Cr.	.30	-	-	-	0	+	+	+
CEEL 18 Twelve Mile	.38	-	-	-	0	+	+	+
CEEL 19 Middle Cr.	.27	-	-	-	0	+	+	+
CEEL 20 Hyde Ridge	.25	-	-	-	0	+	+	+
CEEL 21 Green Butte	.33	-	-	-	0	+	+	+
Avg.	**.33**							

[1] Ratings for road density (HE_r), cover (HE_c) and forage (HE_f) ratios based on projected increases or decreases from existing condition. (See Appendix 4-7)
- = Declining condition relative to existing condition.
0 = No change.
+ = Improving condition.

[2] Calculated for BLM and non-BLM-administered lands within elk management areas with greater than 25 percent BLM ownership.

[3] Calculated only for BLM-administered lands.

common alternatives are based on the density of snags available after a management action compared with the number of snags needed to provide for optimum population levels. If three snags per acre are required for optimum number of a species, a target of 60 percent of optimum population levels would correlate to 1.8 snags per acre.

Two levels of analysis were conducted to examine the impacts of the alternatives. First, the number of snags available within stands were modeled over time as the result of various timber harvest regimes. Snag numbers were developed using procedures suggested by Nietro (Brown, 1985) and modeled in the Marcot Snag Simulator model. Second, the age class distributions were examined in light of the number of snags available over time, to estimate the habitat potential on a landscape basis.

Under all alternatives, lands not allocated to intensive timber management would be managed to retain adequate numbers of snags to provide for 100 percent of optimum populations over the long term.

On the lands allocated to timber production in alternatives NA, A, and B, only unmerchantable trees and snags where feasible would be retained in regeneration harvest units. For analysis purposes and based on

Table 4-12. Assessments of short-term impacts on elk habitat in the planning area.

Elk Management Areas	Existing Condition[2]	Predicted Change After Ten Years By Alternative[1]						
	HE$_t$ [3]	NA	A	B	C	D	E	PA
CEEL 01 Gunter	.21	+	+	+	0	-	-	-
CEEL 02 Smith River	.19	+	+	+	-	-	-	-
CEEL 03 Tom Folley	.24	+	+	+	0	-	-	-
CEEL 04 Green Ridge	.21	+	+	+	0	+	-	+
CEEL 05 Yellow Butte	.24	+	+	+	-	+	-	+
CEEL 06 Tyee	.21	+	+	+	-	-	-	-
CEEL 07 Ben More	.19	+	+	+	+	+	-	+
CEEL 08 Tyee Mtn.	.22	+	+	+	0	+	-	+
CEEL 09 Camp Cr.	.23	+	+	+	-	-	-	-
CEEL 10 Middle Mtn.	.32	+	+	+	-	+	-	+
CEEL 11 Rock Cr.	.24	+	+	+	-	-	-	-
CEEL 12 Little River	.21	+	+	+	0	+	-	+
CEEL 13 White Rock	.21	+	+	+	0	+	-	+
CEEL 14 Myrtle Cr.	.25	+	+	+	+	+	-	+
CEEL 15 Deadman Mtn.	.26	+	+	+	-	+	-	+
CEEL 16 Camas Valley	.19	+	+	+	0	+	-	-
CEEL 17 W.F. Cow Cr.	.24	+	+	+	-	-	-	-
CEEL 18 Twelve Mile	.20	+	+	+	-	-	-	-
CEEL 19 Middle Cr.	.32	+	+	+	-	-	-	-
CEEL 20 Hyde Ridge	.23	+	+	+	-	-	-	-
CEEL 21 Green Butte	.32	+	+	+	-	-	-	-
Avg.	**.24**							

[1] Ratings for road density (HE$_r$), cover (HE$_c$) and forage HE$_f$) ratios based on projected increases or decreases from existing condition. (See Appendix 4-7.)
- = Declining condition relative to existing condition.
0 = No change.
+ = Improving condition.

[2] Calculated for BLM and non-BLM-administered lands within elk management areas with greater than 25 percent BLM ownership.

[3] Calculated only for BLM-administered lands.

results under the current plan, no snags would be retained under these alternatives but green cull trees would be retained.

Alternative NA, A, and B would provide essentially no habitat for the dominant woodpeckers following regeneration harvest. Over a 60 year rotation cycle, only during the last decade would suppression mortality created snags become available. The snags would be of a diameter size class suitable for downy woodpeckers (11+ inches dbh) but few would meet the requirements of the other woodpeckers. In the short-term, harvest of older forest would result in a continued decline in habitat for the dominant woodpeckers. Lands allocated to timber production under alternatives D and E would initially function better for dominant woodpeckers as existing snags would be retained on harvest units. Habitat would be provided for woodpeckers utilizing open areas (northern flicker, downy woodpecker, and red-breasted sapsucker) through the first rotation but habitat on succeeding harvest rotations would be similar to alternatives NA, A, and B. The rotation cycle would not provide for trees of a diameter class to meet the requirements of most woodpeckers. In the short-term the factor with the greatest effects or impacts to dominant woodpeckers is the number of acres harvested in the mature and old-growth age classes.

Lands managed under the low retention prescription in alternative C and in the connectivity areas under the preferred alternative are similar in their impact on dominant woodpeckers. The PA would retain twice the number of snags following regeneration harvests as would be retained under alternative C. This would result in a greater decline below optimum under alternative C. Between 60 and 70 years following harvest, suppression mortality would result in adequate snag recruitment to provide habitat at 60 percent or greater of optimum for low retention prescriptions under alternative C, and connectivity areas and OGEAs under the preferred alternative. Lands managed under the high retention prescription in alternative C would not drop as far below optimum population levels as those lands under the low retention prescription in alternative C because greater green tree retention in high retention areas would provide a source for a greater numbers of large snags. Alternatives C and PA would maintain dominant woodpecker habitat generally above 60 percent of optimal once the regenerated stands reach 60 to 70 years of age. Initally snags retained on harvest units would be available but as these trees are lost, conditions would fall below the 60 percent of optimum. Under the high and low retention prescriptions in alternative C, areas would be at the 50 percent and 40 percent levels respectively 10 years after harvest. These levels would decline until approximately 60 to 70 years after harvest when snag recruitment from suppression mortality of suitable diameter snags would occur. The connectivity areas under the PA would be similar to lands managed under the low retention prescription in alternative C except that twice the number of existing snags would be retained following harvest. This would provide habitat at approximately 60 percent of optimum for the first decade following harvest. The GFMA under the PA would also provide approximately 60 percent of optimal conditions for the first decade following regeneration harvest. Conditions would drop below the 60 percent level over the next forty years as snag recruitment from retained trees would not equal snag loss rates. For the remainder of the harvest rotation, the habitat would average at the 60 percent of optimum level.

On a landscape basis each alternative has been evaluated based on the number and size of snags available by management prescription over time and the forest age class distribution at 10 and 100 years. The results of the analysis for BLM lands within the planning area are shown in Table 4-13. The result are most significant when comparing the relative impacts of the alternatives to each other. The abundance of snags is just one factor affecting woodpecker populations. It has been used in this analysis to indicate the relative effects on woodpecker habitat and populations.

Table 4-13 Percent of Optimum Woodpecker Population on BLM-administered lands within the Roseburg District.*

	Alternatives					
Year	A	B	C	D	E	PA
10	35	38	55	54	57	52
100	15	24	71	74	90	70

* Existing Condition = 54 percent of optimum

In the short-term alternatives A, B, and NA would result in a decline in the percent of optimum rating. Alternatives C, D, E, and the preferred would not change significantly. Within the Roseburg District there are very few forest stands of a size and age that will develop woodpecker habitat over the next decade. Since alternatives C, D, E, and PA retain existing snags, little change is reflected in the first decade. Only alternatives A, B, and NA (NA is considered to be very similar to B) would significantly decline in the short-term.

In the long-term alternatives A, B, and NA would reduce population levels below the 40 percent level. Lands allocated to timber production would provide almost no habitat while forest lands withdrawn from timber production would function at 100 percent of optimum.

In the long-term, alternatives C, D, E, and the preferred would provide for populations above the 60 percent of optimum level. Over time conditions on past harvest units would improve, resulting in an overall increase in the percent of optimum populations above current estimates. Alternative E with the fewest acres allocated to timber production would function at the highest percent of optimum in the long-term.

The cumulative effects on dominant woodpeckers would be a combination of populations on BLM-administered lands and private forest land. Current forest practice regulations on private lands require that a minimum of two snags or green trees (one conifer) per acre be retained. This level of snag and green tree retention along with generally shorter harvest rotations will result in the majority of woodpecker populations occuring on BLM-administered lands. Management on BLM-administered lands for 60 percent of optimum would generally result in a much lower level across the landscape wherever ownership is in a checkerboard pattern.

There are over 50 species in the planning area which require tree cavities. The cavities for these animals are for the most part created by woodpeckers. The impact for these cavity dependant species parallels that of the dominant woodpecker.

Impacts on Other Species

Osprey

The majority of occupied osprey nesting and foraging habitat on major rivers would be protected under all alternatives by bald eagle management requirements. Management of riparian areas under alternatives B, C, D, E, and PA would provide protection in relation to RMA width provided for under each alternative to smaller streams and water bodies. Alternative E would provide the greatest level of protection by protecting all nesting habitat within 1/4 mile of both major and intermediate size streams. The preferred alternative protects current nest sites. Potential nest sites would be provided protection through bald eagle habitat management and management of riparian areas. In the short and long term, osprey populations would be expected to remain stable or increase under all alternatives except alternative A. Alternatives C, D, E, and PA would provide the habitat for osprey populations to increase. Osprey have responded positively to the installation of artificial nesting structures (Witt 1990) and would be expected to benefit from this type of practice under all alternatives. Approximately 10 percent of the ospreys along the Umpqua river nest in upland areas (Joseph Witt pers. cmm., April 19, 1991). Potential nesting habitat in these situations would be least impacted under alternatives C, D, E, and PA. The general effect of each alternative on osprey as well as other species is displayed in Table 4-14.

Golden Eagle

The abundance of golden eagles in western Oregon appears to be related to both the availability of oak woodland, grassland, and early forest seral stages as foraging sites, and mature and old-growth timber as nesting habitat. The golden eagle is a fairly adaptable species and apparently can nest in small blocks of appropriate habitat (Robert Anderson, pers. comm., 1989). In the short and long term, alternatives C, D, E, and PA would likely result in maintenance of current levels of golden eagles. Foraging sites would likely be available on adjacent private lands under all alternatives. Alternatives NA, A, and B would likely result in decreased abundance due to elimination of nest trees/ sites on the valley edges and across much of the landscape. Alternatives C, D, E, and PA would all provide for the retention of significant blocks of mature and old-growth habitat, retention of wildlife trees on harvest units and the protection of known nest sites.

Great Blue Heron

Great blue heron abundance is related to the availability of suitable nesting habitat in riparian and adjacent mature and old-growth forest. In the short term and long term numbers of great blue heron are expected to remain stable or increase under all alternatives except A. Habitat protection would be provided by RMAs and managing bald eagle habitat. Greater protection is provided to nesting and foraging areas as the width of riparian management areas increase by alternative. Compliance with the Pacific Bald Eagle Recovery Plan and bald eagle management guidelines under all alternatives provides protection on lands along the major rivers. Riparian habitat and existing heron rookeries on private land receive some protection

Table 4-14. Estimated effects of alternatives on other wildlife species.

Species	Short Term/Long Term	NA	A	B	C	D	E	PA
Osprey	ST,LT	0	-	0	+	+	+	+
Golden eagle	ST,LT	-	-	-	+	+	+	+
Black-tailed deer	ST	-	-	-	0	+	+	+
	LT	-	-	-	+	+	+	+
Mountain Lion	ST,LT	-	-	-	+	+	+	+
Wild Turkey	ST	0	0	0	+	+	+	+
	LT	-	-	-	+	+	+	+
Black Bear	ST,LT	-	-	-	+	+	+	+

+=improvement 0=no change-=decline

under Oregon Forest Practices Act (OFPA) rules, although less than would be provided on BLM-administered lands under alternatives C, D, E, and PA.

Neotropical Migrant Birds

There has been increasing concern in recent years concerning the apparent widespread population declines of bird species which migrate between North America and Central or South America. The cause of the declines are unknown, but possible reasons include habitat loss on the breeding or winter ranges, pesticide use or other factors.

There are over 30 species of neotropical birds nesting within the study area that winter primarily in Central or South America. Many have varied habitat needs which makes it difficult to assess impacts on this group. The majority of neotropical species utilize mature and old-growth forest but many also utilize habitat edges and open areas for feeding. Riparian areas are also a preferred habitat for many neotropical birds.

Alternatives C, D, E, and PA which retain significant amounts of mature and old-growth forest habitat intersperced with younger more open forest types would benefit the greatest number of neotropical birds. Alternatives NA, A, and B, which retain the least amount of mature forest, would favor the fewest neotropical species. Hermit warblers, swainson thrush, veery, and several vireos generally are confined to older forest types and would benefit the most from large blocks of mature forest.

Neotropical migrants which nest primarily in the Pacific Northwest are of greater concern since they would be effected the most by habitat conditions within the planning area. The Vaux swift, rufus hummingbird, the hermit, Townsend's and Mac Gillivray's warblers fall in this category. Other than the hermit warbler, these birds utilize both mature and young seral stages. Of particular concern with this group of species is the cumulative effects of the alternatives in conjunction with the large scale habitat changes created by federal and private timber harvest, and land development in the Pacific Northwest, along with habitat loss and pesticide use on the wintering grounds. It is quite likely that several of these species have experienced substantial population declines in the past few decades and are more vulnerable to future habitat changes. Long-term monitoring and inventories are lacking in the western United States. However, no major declines have been conclusively documented.

Black-tailed Deer

Densities of black-tailed deer are currently high in the district, and habitat conditions are not expected to change significantly during the next decade. Thus, in the short term the abundance of black-tailed deer would be roughly comparable under all alternatives. Changes in cover as discussed under elk would occur. At some point loss of optimum cover would affect deer populations. At what point and to what degree the loss of optimum cover would affect deer is not known, however, it is likely that the higher the elevation, the greater the impact. In the long term, black-tailed deer numbers are expected to fluctuate in response to the "boom-and-bust" phenomenon of forage levels resulting from even-aged management of timberlands in western Oregon (Brown 1985). This phenomenon is characterized by an initial high abundance of forage in response to overstory canopy removal, followed by low production of forage due to increasing shade from the overstory canopy.

Deer populations tend to increase during periods of high browse availability only to crash when forage is scarce. In the long term, alternatives NA, A, and B would maintain fluctuating populations of black-tailed deer. Alternatives C (R and R blocks and high retention prescription areas), D (HCAs 1, 2, and 3), and E would provide greater stability of black-tailed deer populations (although at a lower level than alternatives NA, A, and B) by reducing the amount of clearcutting on BLM and by increasing the availability of mature and old-growth cover. Adequate amounts of forage should be available under all alternatives, because of intensive forest management on intermixed private lands. Management practices identifed for elk would also benefit deer. The preferred alternative impact on numbers of black-tailed deer would depend on the management allocation of the lands. OGEAs under the preferred alternative would sustain relatively stable populations, while in the short term connectivity areas and the GFMA would increase the likelihood of boom-and-bust cycles.

Cumulative effects of alternatives NA, A, and B on BLM-administered land and actions on other lands in the planning area would likely perpetuate the "boom-and-bust" phenomenon because many private lands are currently managed under short rotations. These short rotations are expected to continue in the future as companies respond to market demand. Cumulatively, more stable deer populations would be anticipated under alternatives C, D, E, and PA. This is particularly true on those lands for each alternative which would provide cover habitat intermingled with private lands.

Black Bear

Black bears are omnivores and forage heavily on fruits, green forage, and tree cambium. Such foods tend to be more prevalent in younger seral stages. However, Noble et al. (1990) recently pointed out that since black bears use large rootwads as den sites, they should also benefit from areas of mature forests. The authors further stated that policies which protect snags and dead and downed woody material should improve bear habitat. Thus, moderate to high populations of bear would be anticipated in areas with a good mixture of younger seral stages for food and mature stands for denning habitat. The level of human disturbance as related to open roads is also important in determining the suitability of habitat for black bear. Thus, impacts to black bear habitat are very similar to those of Roosevelt elk.

Cumulatively, alternatives NA, A, and B would degrade black bear habitat as old-growth forest is depleted and roads increased on private and BLM-administered lands. Alternative E would most effectively blend cover and den sites on BLM-administered lands with forage areas on private. Alternatives C, D (HCAs 1, 2, and 3), and PA (OGEAs and connectivity areas) would effectively blend habitat needs similar to alternative E on lands where lands are not allocated to intensive timber management. Alternatives C and PA which retain large numbers of green trees in harvest units would have less adverse impact on black bear populations than alternatives NA, A, and B that retain few wildlife trees in harvest units. Retained trees in harvest units would provide a source of large down logs as future den sites.

Cougar

Cougar numbers are apparently dependent upon the abundance of deer since deer are their major food source. Therefore, alternatives which benefit black-tailed deer habitat should at least maintain or increase cougar numbers in western Oregon (ODFW 1987). Cougar, being a shy animal, are also sensitive to roads. Thus overall impacts on cougar would not only parallel those of black-tailed deer but also Roosevelt elk and black bear. In the short-term, cougar populations are expected to remain comparable to existing levels. In the long term, Alternatives NA, A, and B would be expected to reduce current cougar populations because deer populations would vary widely over time in response to variable forage levels. Alternatives C, D, and E would provide progressive stability of deer numbers and would support more stable (although at times lower) levels of cougar. The PA would effect numbers of cougars differently depending on management allocation of the lands. The OGEAs would provide the greatest stability while increased roads and fluctuating prey populations in the GFMA and connectivity areas would be less desirable habitat in the short and long term.

Amphibians

The abundance and diversity of amphibians is related to the availability of stable, undisturbed riparian zones along streams and ponds as well as talus and dead and downed woody debris which help retain moisture. Water quality is also an important factor (Nussbaum et al. 1983). The limiting factor for many amphibian species is the availability of free water and moist substrates on land for breeding (Ibid). The quality and quantity of riparian zones under the various alternatives are major determinants in the quality of habitat for amphibians.

In the short term, less amphibian habitat would be impacted under alternatives C, D, E, and PA compared to NA, A, and B due to fewer acres impacted by timber harvest, increased protection and improved condition of riparian habitats (see Riparian section of this chapter), greater protection of special habitats, and greater amounts of dead and down logs. In addition, alternatives C, D, E, and PA would provide greater protection of upslope habitat than other alternatives, thus alternatives C, D, E, and PA would protect more of the small, headwater streams important to species such as the Olympic salamander and tailed frog (Ibid). Many of the amphibians are dependent on special habitat sites such as bogs, small ponds, and meadows. Alternatives C, D, and E provide the greatest protection for these areas including a buffer to maintain ecological conditons of the site. Alternative E in particular would provide the best distribution of this habitat with no additional losses. In the short term, riparian habitat conditions and the amounts of down dead material would suffer set backs whenever timber harvest activities occur.

Management of OGEAs under the preferred alternative would improve habitat for amphibians particularly those utilizing both riparian and upland old-growth forest. Amphibian habitat within connectivity areas would decline in the short term as existing mature and old-growth stands are harvested. In the long term, retention of large down woody material and 12 to 16 green trees per acre in harvest units would provide a greater array and legacy of old-growth forest components. Stands in the connectivity area would recover old-growth character about 100 to 120 years after regeneration harvest. In the long term, 25 to 33 percent of the landscape within connectivity areas would consist of spatially well distributed old-growth stands. In the short term, amphibian habitat within the GFMA would be degraded although habitat for some amphibians would be provided. In the long term, the GFMA would provide old-growth legacies but would not provide old-growth character stands. Amphibians dependent on old-growth forest habitat would likely be greatly reduced or disappear from lands in the GFMA.

Cumulative effects of the alternatives which provide the largest RMAs and greatest amount of old-growth would likely maintain or improve the condition for amphibians in the long term. As habitat on private land improves as a result of OFPA rules, improvement in overall habitat within watersheds should also occur.

Effects on Fish

Forest management activities impact fish habitat and production primarily by removing forest canopy and riparian vegetation. The loss of riparian vegetation can create short-term adverse impacts, such as increases in water temperature, increases in spawning bed siltation, and depletion of food sources. A long-term adverse impact, caused by removal of large conifer trees in the riparian zone, is depletion of large woody debris in stream channels and the resulting loss of habitat cover and diversity. The canopy removal from combined BLM and non-BLM harvesting within a watershed increases peak flows if a large amount of canopy is removed within a few years time. Increased peak flows occur during heavy rains or rain on snow events and can cause extensive scouring damage with long term adverse impacts to stream channels and habitat. When channels are scoured to bedrock, the recovery process does not begin until large woody debris is again present in the system. Frequency and intensity of peak flows are reduced by retaining canopy cover that reduces the force of precipitation striking the soil, allows soil to absorb water, and slows the melting and runoff of snow. Scouring and habitat damage are moderated by large woody debris in the stream that protects the stream hydraulics and dissipates stream energy.

The quality of riparian zones with regard to fish is related to the structure of the vegetation (Bisson et al. 1988, Brown 1985). The input of large woody debris from forests to streams is a major link between terrestrial and aquatic ecosystems (Lienkaemper and Swanson 1986). A basic assumption in evaluating the quality of riparian vegetation is that mature riparian zones dominated by large conifers maintain or enhance stream channel conditions. Downed large trees provide instream habitat for fish by creating pools and backwater areas, and they improve water quality by trapping sediments and slowing high flows. Sedell et al. (1988) showed that the number of downed trees and pieces of large woody debris varied with stand age of riparian zones. Streams flowing through young-growth forests and recently harvested areas contained from one-fifth to one-twentieth the number of large woody debris pieces found in streams in mature forests. The width of a riparian protection area determines the potential amount of large woody debris in a channel. A 94 foot retained width on each side is capable of providing most of the necessary large woody debris (Murphy and Koski 1989), and a retained width of 164 feet on each side is capable of providing an optimum amount of large woody debris (Van Sickle and Gregory 1990). Within old-growth conifer forests, 98 percent of the large woody debris comes from within 150 feet of the stream (McDade et al. 1990). Logging impacts to aquatic benthic invertebrates were detected in streams with buffer widths of less than approximately 30 meters (98 feet) (Erman et al. 1977). RMAs of less than approximately 95 feet are considered inadequate for proper riparian function, and RMAs smaller than 150 feet are considered to be functioning less than optimally.

This discussion centers on the effect of actions taken to protect fish habitat from timber harvest activities. Fish habitat conditions are directly influenced by activities in the riparian zone and indirectly influenced by cumulative impacts within the watershed. Size and conditions of RMAs influence the impact to instream habitat structure and function. The amount and type of activity outside RMAs contribute to cumulative effects (frequency and intensity peak flows, channel scouring, and sediment deposition). Table 2-1 summarizes land allocations and site disturbing activities including timber harvest for each alternative. The impact assessments of RMA widths protection applies only to stream segments within BLM-administered lands.

Large woody debris would not be removed under any alternative from streams except for road crossings. Existing mining laws allow mining activities in RMAs that could have adverse impacts under all alternatives. Regulations require that mitigating measures be taken for adverse impacts associated with mining. Roads exist along many streams and adversely impact riparian and stream conditions through canopy removal, soil compaction, erosion and sediment deposition, soil compaction, and culvert placement. New roads would no longer be built in valley bottom riparian areas. See Table 4-1 for miles of roads that would be constructed under the alternatives. New roads would mostly be higher in the watersheds crossing steeper side slopes, and smaller first and second order streams. There would be minor short and long term impacts associated with this construction (canopy removal, soil compaction, erosion) that would have minimal adverse impacts on small riparian areas. There would be a potential for adverse impacts to riparian zones due to the risk of road failures in these steeper areas. Impacts to riparian areas from recreational activities would be insignificant both in the short and long term across the district. Although minimal, adverse impacts from increased campground use, campground construction, increased boating, boat ramp construction, and increased ORV use would include soil compaction, canopy removal, erosion, streambank degradation, stream sedimentation, and wildlife disturbance.

Riparian influenced impacts to fish habitat conditions in third order and larger streams with adjacent BLM-administered lands would not be significant due to retention of all vegetation in RMAs in third order and larger streams under alternatives B, C, D, E, and PA, except third order streams in alternative B. The RMA widths which are less than 95 feet for alternative A, and third order streams in alternative B would not provide sufficient large woody debris in the long term and would preclude development of optimum habitat conditions for the first 40 years after harvest. First and second order perennial streams under all alternatives, except NA would also have inadequate RMA widths that would preclude development of optimum conditions. First and second order perennial streams would have no riparian protection under alternative NA. Logging across these small streams has caused major habitat degradation in the past. These RMAs would not provide most of the large woody debris (Murphy and Koski 1989) necessary compared to present. The primary short term affects of these RMAs would be the prevention of physical habitat damage, and water and sedimentation increases that would have occurred with timber harvests. After 40 years, riparian conditions would have recovered to fair, and in the long term, large woody debris would again be naturally entering first and second order perennial streams. These streams would begin to function naturally and fish habitat would improve to fair condition. Second order intermittent streams under alternative D and first and second order intermittent streams under alternative E would receive narrow RMA protection. The fish habitat in these streams would benefit in the long term similar to first and second order perennial streams. First and second order intermittent stream riparian habitat would be in minimal, recovering to fair until the area is harvested again under all alternatives (except alternative NA) with the addition of a 25 foot no cutting brush and hardwood strip left on each side of the steam. These streams would be unprotected under the NA alternative.

In the short term, stream temperatures and sedimentation would not increase as compared to the present. Physical stream habitat degredation would still occur if logging through these streams occured. While many lower order streams do not contain fish, their protection (less physical habitat damage, more shading, less temperature increase, less sedimentation) would ensure that impacts would be minimized and not transferred downstream to fish bearing streams. Under alternatives C and PA, the various land treatments provide that trees would be retained on harvest units. See Table 2-1 and the Chapter 2 for further discussion of each treatment. Some of the retained trees on harvest units under alternatives C and PA would be left along intermittent streams and would aid stream bank stability and provide natural large woody debris input. Under the preferred alternative, all fish bearing streams would be given RMAs of 150 feet or larger on each side.

Cumulative impacts are a result of the total number and area over time of site disturbing activities including timber management and road construction on all land ownerships. Cumulative impacts (soil compaction, frequency, and intensity of peak flows) to stream habitat conditions would be the greatest under alternatives NA, A, and B as more site disturbing activities occur including intensive timber management and road construction. Alternatives C, D, E, and PA would have less site disturbing activities compared to alternatives NA, A, and B. In those areas restricted from timber harvest, stream habitat conditions would improve. In unrestricted areas, conditions would be similar to those under alternatives A and B. Alternatives C and PA would have less intensive timber management practices than alternatives NA, A, B, D, and E. Cumulative impacts under alternative E would be the least of all alternatives due to the low amount of site disturbing activities overall.

In all individual alternatives, there would be only small differences in impacts between the short and long term. A lack of large woody debris input would be more noticeable over the long term and the number of peak flow events, channel sluice-outs and landslides would be greater over the long term even though they occurred at a constant rate. Appendix 4-15 discusses the methodology for assessing effects on fish habitat and populations. The expected short and long-term conditions of fish habitat under all alternatives except A are displayed in Table 4-15.

If all riparian vegetation were retained and maintained along all perennial streams, eventually habitat conditions would improve and water quality would be favorable for optimum fish production. Large woody debris provided by the riparian area appears to be the

Table 4-15. Condition of stream habitat in the short term and long term

		Habitat Quality (miles)							
Stream	Stream	Existing			Short term			Long term[1]	
Order	Miles	Minimal	Fair	Good/Opt.	Minimal	Fair	Good/Opt.	Fair	Good/Opt.
3	447	167	33	247	159	39	249	89	358
4	205	67	15	123	64	17	124	41	164
5	84	30	4	50	28	6	50	17	67
6	28	8	2	18	7	3	18	6	22
7	15	3	1	11	3	1	11	3	12
8	1	0	0	1	0	0	1	0	1
9	3	0	1	2	0	1	2	1	2

[1] Long term does not include alternative A. Two hundred years was selected for the long-term period. Good/optimal stream habitat conditions in BLM administered streams with substantial riparian areas can be expected in 80 percent of the streams . Roads in the riparian area, landslides, fires 100 year flood events, etc. would keep 20 percent in fair condition. (Stream habitat quality is directly linked to tree size in riparian areas; see Appendix 3-7 and Appendix 4-15.

Table 4-16. Potential Fish Production Capability.

	Existing Conditions		Short-term		Long-term [1]	
Species	Smolts	Adults	Smolts	Adults	Smolts	Adults
Coho	318,900	23,900	322,000	24,100	381,300	28,600
Chinook	83,700	7,900	87,000	8,200	149,300	14,200
Steelhead	24,300	34,200	26,600	2,600	70,700	49,910
Cutthroat	26,660	8,000	26,900	8,100	32,300	9,700

The assumptions, analytical techniques, and factors used to derive these estimates are described and displayed in Appendix 3-7.

[1] The long term habitat conditions from Table 4-15 were used in these calculations.

most important component controlling habitat conditions and salmonid populations. Partial or total removal of large woody debris sources usually results in reduction of pool and off-channel habitat and fish populations (Andrus et al.1988, Bilby and Ward 1989, Heifetz et.al. 1986, House and Crispin 1990, House et al. 1989, House and Boehne 1987, House et al. in press). The potential production of naturally spawning (wild) fish using stream segments with adjacent BLM-administered land are shown in Table 4-16. (The long term estimates do not apply to alternative A.)

In the long term (200 years) management under alternatives NA, A,and B would leave fish populations below potential levels due to streams being in less than optimum condition. Alternative NA would not provide any protection to first and second order streams. Alternatives NA, A, and third order and smaller streams under alternative B would not provide most of the necessary large woody debris input for proper stream habitat function (Murphy and Koski 1989), while alternatives NA, A, B, and C would not provide the optimum large woody debris input for optimum stream function (Van Sickle and Gregory 1990). Under alternatives D, E, and PA, stream habitat function would be close to optimum. Alternatives NA, A, and B with the most timber management activites compared to other alternatives also would present a higher potential for cumulative impacts. These would include increased sedimentation which can fill in pool habitat and cause embeddedness of spawning gravels reducing spawning success, and increased flows which can scour channel bottoms to bedrock and remove channel structure and fish habitat. Populations would decline under alternatives NA and A given the timber harvest levels and insufficent RMA widths. Under alternative B the affects of increased protection of small streams could offset the timber management activity. Under alternatives C, D, E, and PA, populations of priority fish species in BLM-administered streams could improve and theoretically reach optimum levels under alternative E. However, there are factors beyond BLM control, which adversely affect achievement of optimum levels. These factors include ocean exploitation rates (both foreign and U.S. fleets), climatic conditions (both ocean and freshwater), natural predation, disease, agricultural practices, and urban growth. Without sufficient escapement of adult spawners, optimum population levels will never be reached. In addition, riparian habitat on private land is managed under guidelines of the Oregon Forest Practices Act, which requires less retention of riparian vegetation than is proposed under any alternative except alternative A on BLM-administered lands. Large trees and large woody debris have been removed from private lands and probably will not be replaced in the future. Therefore, long term cumulative effects of timber management in individual watersheds, especially those with large private holdings, would be an overall shortage of large woody debris and habitat for priority fish species, and increased peak flows regardless of BLM management. Consequently, protection of habitat on BLM-administered lands becomes more important.

Effects on Special Status Species

Introduction

Impacts to federally listed and proposed species would not occur beyond which is permitted by the Endangered Species Act (ESA). At this time, three listed wildlife species and no listed plant species are known to occur on BLM-administered land in the planning area. Impacts to other special status plant and animal species will vary between alternatives depending on the category of the species, and the administrative status of the land on which they are known to occur, and the occurence of these species on or near lands allocated to timber production.

Plants

Impacts to special status plants and their habitats could occur from a variety of activities which take place in the planning area in conjunction with management of other resources. Those activities which pose the greatest threat are associated with timber management, mineral development, and recreational development. Known individual populations of special status plants are generally small in size and scattered. Timber management activities could alter or destroy habitats and

Western Wake-Robin.
Photo by Russ Holmes

special status plant populations within the forested landscape by timber removal, pre-commercial thinning, mortality salvage, vegetation control, fertilization, road construction, and rock quarry development. Some species could benefit from disturbance activities which open the canopy or simulate natural disturbance. Serpentine soil sites are known to support a number of special status plant populations. Mineral development of these sites could destroy plants and alter habitats by activities such as mineral exploration, mineral removal, road construction, and other surface disturbance activities.

Recreation could impact special status plants especially where the resource attraction is special status plants or the unique flora of which they are a part. High use during times of flowering could impact populations by trampling and collecting. Other recreational pursuits, such as off road vehicle use, have impacted special status plants in the past. Interpretation associated with recreation, however, could increase public awareness and sensitivity to native vegetation and ecosystems resulting in less inadvertent damage to special status species and their habitat.

Under the no action alternative and the preferred alternative, all categories of special status plant species would be protected except assessment species. A total of five assessment species that are presently known to occur on 139 acres not reserved or protected would be subject to impact.

Under alternative A, harvest of timber stands and other activities associated with timber production may adversely impact the quality and quantity of habitats of all categories of special status plants except those which are officially listed and have critical habitat designated or a recovery plan in place. Special status plants that occur in special habitats such as serpentine barrens, and not on commercial forest lands would still be vulnerable to direct and indirect impacts from adjacent timber management, road building and other management activities. Under alternative A, a total of six special plant status species presently known to occur on 235 acres that are not reserved or protected in Alternative A would be subject to impact.

Impacts under alternative B and C to special status plant species would be similar to alternative A. Alternative B would provide protection on PD lands and reserved old-growth blocks. Alternative C would provide additional protection on PD lands and lands managed to maintain biological diversity. Under alternative B, a total of six special plant status species presently known to occur on 232 acres that are not reserved or protected in alternative B would be subject to impact. Under Alternative C, a total of six special status plant species presently known to occur on 204 acres not reserved or protected in alternative C would be subject to impact.

Under alternatives D and E all known locations of special status species are protected and buffered. Special status plants would be protected from direct and indirect impacts the most under alternative E with the use of 600 foot buffers around all populations where timber harvest and all surface disturance would be prohibited. Alternative D and the preferred alternative would protect special status plants from direct impacts with the use of 300 foot and 100 to 300 foot buffers respectively. Indirect impacts would be possible in some cases depending on the locations of the special status plant population and factors such as slope and topographic position.

Effects resulting from timber management activities would be detrimental to six special status species requiring old-growth and mature habitats under alternatives A, B, and C. Figure 4-4 compares the acres of old-growth lost or gained under each alternative. Over time, important habitats and populations of these species could be lost. Alternatives C, D, E, and the preferred alternative would enhance the quantity and quality of old-growth and mature habitat so those species utilizing this type of habitat would be maintained or increase.

There is no protection provided to special status plants on private lands. However, on neighboring National Forest lands, many of the same plants are managed. Modeling to determine minimum viable populations and extinction probability has not been used for special status plant species. Therefore, it is not known what percentage of populations could be eliminated and the population still remain viable.

Wildlife

Bald Eagle

All alternatives provide for the protection of current and potential nest and roost sites along the Umpqua river systems, and are consistent with the Pacific Bald Eagle Recovery plan. Six existing nest sites and potential habitat would be protected under all alternatives to meet recovery plan goals. Alternatives C, D, E, and PA would continue implementation of the Umpqua River Corridor HMP which outlines action to improve and perpetuate bald eagle nesting territories. These alternatives also provide for aquisition of two existing nest sites as well as future occupied nest and roost sites. Such acquisitions would strengthen the long term protection and maintenance of the sites for bald eagles.

Under all alternatives, bald eagle populations on BLM-administered land would be expected to remain stable or increase in the short term and long term due to protection of all existing and potential nest sites. The bald eagle in the Pacific Northwest is a large tree obligate species. Although not directly dependent on old-growth ecosystems, the eagle is dependent on groves of large trees for nesting sites. Alternatives C, D, E, and PA would provide more of these types of nesting sites in the long term whereas alternatives NA, A, and B would provide limited potential nesting sites sites outside of lands managed specifically for bald eagles.

The cumulative effects of alternatives NA, A, and B and actions on other lands in the planning area would not adversely affect current levels of bald eagle habitat and populations. OFPA rules for bald eagle and riparian habitat were recently revised to provide roosting and foraging habitat in addition to existing protection of active nest sites. The cumulative effects of alternatives C, D, E, and PA would be to provide more potential nesting sites in the long term than the additional breeding pairs targeted in the recovery plan. From a western Oregon perspective, similar levels of habitat protection on other federal lands (e.g., national forests and other BLM districts) would tend to result in modest increases in bald eagle habitat and populations over time.

Marbled Murrelet

This species has not been observed within the planning area. As a result, the alternatives would impact no known Marbled Murrelets or their habitat. This discussion of impacts is based on changes in potential Marbled Murrelet habitat. Suitable nesting habitat for this species has been estimated from the acres of mature and old-growth forest (150 years) occuring within 50 miles of the coast. Approximately 50,000 acres of the total 191,000 acres of BLM-administered lands occurring within this band is currently suitable habitat. In the short term alternatives NA, A, and B would reduce the amount of potential habitat by approximately 60 percent. Alternative C would reduce potential habitat by approximately 20 percent in the short term while alternative D and the preferred alternative would result in a 10 percent reduction. No habitat would be lost under alternative E. In the long term only riparian management areas, bald eagle habitat, and ACECs would remain as suitable habitat under alternatives NA, and A. Additional habitat would be provided by old-growth and mature blocks under alternative B; R and R blocks, and portions of high and low retention areas under alternative C; HCAs under alternative D; and OGEAs and portions of connectivity areas under the preferred alternative. Under alternative E all existing suitable habitat would be retained plus adjacent stands would be allowed to age and develop into suitable habitat. Table 4-17 shows harvest acres and impact to potential Marbled Murrelet nesting habitat.

The cumulative effects of alternatives NA, A and B and actions on other private lands would likely eliminate most murrelet habitat. Because there is no specific protection provided under current Oregon Forest Practices Act (OFPA) rules, murrelet habitat and populations are not expected to increase from already low levels on private lands in the short or long term. Since additional older forest protection would be available under alternatives C, D, and, E (assuming no change in murrelet habitat on private lands), the cumulative effects would result in the retention of greater amounts of suitable murrelet habitat within the planning area. The preferred alternative would result in a 5,000 acre reduction of suitable habitat over the short term. This loss would be offset to some degree by existing stands in the 140 year age class within OGEAs growing into suitable habitat over the decade. In the long term, connectivity areas would provide nesting habitat for the later part (after 100 to 120 years) of the rotation cycle. From a western Oregon perspective, levels of old-growth habitat protection included in

Table 4-17. Impacts to potential Marbled Murrelet habitat during the first decade under the various alternatives.

	Current	Proposed Harvest Acres (thousands) Over Next Decade/Impact					
Murrelet	NA	A	B	C	D	E	PA
Short Term	30/-	33/-	30/-	9/-	5/-	0/+	5/-

+ favorable impact, increase in acres of suitable nesting habitat
- adverse impact, decrease in acres of suitable nesting habitat

the Record of Decision of the USFS Region 6 spotted owl EIS and the BLM western Oregon RMP/EISs would tend to result in modest increases in murrelet habitat and populations over time.

White-footed vole

This species is impacted primarily by management of riparian habitat and dead and down large woody material. Alternatives NA, A, and B provide the least protection for these habitats while alternatives C, D, E, and PA provide for larger riparian managment areas and large areas dedicated to old-growth forest. Over the short term, approximately 2/3 or more of BLM-administered lands within the most likely distribution of the white footed vole would be managed to maintain or restore old-growth conditions under alternatives C, D, E, and PA. Cumulatively, OFPA regulations for riparian habitat on private lands and riparian management areas, and restriction and emphasis on old-growth forest on BLM-administered lands would result in improved habitat conditions over the current situation.

Peregrine Falcon

Although there have been sitings in the planning area, there are no known peregrine falcon sites on BLM-administered lands within the planning area. As a result the alternatives would impact no known Peregrine falcons or their habitat. Potential suitable nesting cliff habitat would be protected under all alternatives. Alternatives C, D, E, and the preferred alternative would improve the chances of establishing a breeding population in the district by providing greater protection of cliff habitat. These alternatives would also provide a greater degree of protection for sites occupied in the future than would be provided under alternatives NA, A, and B.

Columbian White-tailed Deer

All alternatives would be in compliance with the Columbian White-tail Deer Recovery Plan as well as maintaining existing habitat on BLM-administered lands. The number of acres of BLM-administered lands affected is very minor particularly within the core area. Alternatives C, D, E, and the PA afford the opportunity to provide long term security and management of core area habitat. BLM could contribute in acquiring a portion of the acreage needed for the recovery of the species but the goal of 5500 acres of secure habitat within the core area will likely require the combined efforts of numerous groups and agencies. Timber harvest within occupied habitat would only occur when the species would not be adversely affected.

Townsend Big-eared Bats

The primary habitat features required by this species are caves and talus consisting of large boulders. These physical features would be protected under all alternatives, but maintenance of environmental conditions on these sites would vary by buffer width provided by each alternative. Alternatives NA, A, and B do not provide for buffers and the suitability of potential or unknown sites would be lost. Alternatives C, D, E, and PA provide for buffers as well as protection of the special habitat feature. Alternatives D, E, and PA would pursue acquisition of one known hibernaculum located on private land and restrict pesticide use within the normal foraging range of known nursuries and hibernacula. Based on protection of roosts, the population could decline under alternatives NA, A, and B, remain stable under alternative C and remain stable or slightly increase under alternatives D, E, and PA. Primary foraging areas for this bat are over open water/riparian areas and early successional forest stages. The greater the riparian protection and the addition of acres of early successional forest, the more foraging habitat would be available. Alternatives B, C, D, and PA come closest to providing both types of foraging habitat.

Northern Spotted Owl

The primary land management activity affecting spotted owl habitat is timber management. Timber harvest removes habitat or could reduce habitat suitability. Silvicultural treatments could speed recovery and regrowth of habitat characteristics.

Other activities which could affect spotted owls or their habitat include mining, road construction or other activities which remove or alter coniferous forests; operation of machinery or other types of activity which could adversely affect nesting and reproductive success; granting rights-of-way or road use permits which could lead to habitat loss on federal and non-federal lands; and land exchanges which transfer habitat to private ownership which would then be subject to timber harvest, development or other habitat loss.

Effects on Suitable Habitat

Aerial photography and timber inventory data were used to evaluate the BLM-administered forest stands in the planning area. Based on habitat information in the Interagency Scientific Committee (ISC) report (Thomas, et al 1990), two categories of suitable spotted owl habitat were identified:

Habitat 1 - Comprised of coniferous forest stands that satisfy the full complement of daily and annual needs of the owl for nesting, roosting, and foraging. These stands have a multilayered canopy of several species of coniferous trees with large trees in the overstory and an understory of shade tolerant conifers and hardwoods. The canopy closure exceeds 70 percent. There is a significant measure of decadence in the stand resulting from the occurrence of snags and broken-topped live trees along with dwarf mistletoe infections. The forest floor has substantial accumulations of large down woody material in the form of fallen trees.

Habitat 2 - Comprised of coniferous forest stands, and some hardwood stands which provide roosting and foraging opportunities for spotted owls, but lack the necessary structure for consistent nesting. The roosting and foraging qualities are less than those described for Habitat 1 due to the reduced quality or complete absence of one or more of the components listed above (for example, the absence of large trees in the overstory or a reduced amount of down woody material on the forest floor). Habitat 2 stands generally have less diversity in the vertical structure and have either limited or poorly defined multilayer canopy structure. The understory is somewhat open, allowing for owl movement and foraging. Canopy closure generally exceeds 70 percent.

Currently there are 113,000 acres of Habitat 1 and 94,000 acres of Habitat 2, a total of 207,000 acres of suitable habitat within the planning area. There is a concern that large expanses of Habitat 2, without any inclusions of Habitat 1 to provide nesting groves, would not provide the same level of habitat suitability as if there were a mixture of the two habitat types. Within the planning area it is assumed there would be adequate interspersion of the two types of habitat due to riparian management areas, TPCC non-suitable lands and other lands not available for timber management under all alternatives. Based on this assumption the two categories were combined for all analysis purposes.

Future habitat suitability was estimated by aging existing stands and projecting the location and timing of future harvests, using the 10-year timber management scenario for the short-term projections and random selection from lands available for harvest in each alternative for the longer-term projections. A natural disturbance-caused rate of habitat loss of 0.24 percent per decade was also included in the projection by random selection.

Table 4-18 Stand ages, or time following regeneration timber harvest, when stands become suitable spotted owl habitat.

	Age or Time Following Harvest
Unmanaged Stands	[1]
Naturally Established	70
Established by Even-Aged Harvest	100
Managed Stands	
Even-Aged (Rotation 100 Years or Less)	[2]
Restoration and Retention Blocks (Alt.C)	[3]
35+% Basal Area Retention (Alt.C)	50
15 - 20% Basal Area Retention (Alt.C)	70
Old-Growth Emphasis Areas (PA)	[3]
Connectivity Areas (PA)	70
General Forest Management Areas (PA)	100

[1] Also applies to existing stands managed under approaches designed to emphasize biological diversity.

[2] Stands under this silvicultural regime would never attain suitable habitat condition due to short rotation length.

[3] No regeneration harvests planned. Stands not currently suitable habitat would become habitat at the same age as managed stands depending on how they were established.

The projected development of future spotted owl habitat over time are given in Table 4-18. In estimating the rate of development of future habitat, forecasts were more conservative for habitat development on existing artificially established stands, due to their current lack of large trees and snags and typical single layered, evenly spaced closed canopy conditions.

It is assumed that density management in the restoration and retention (R and R) blocks in alternative C and the old-growth emphasis areas (OGEA) in the PA would not negatively affect attainment or retention of suitable habitat condition. Such harvests could accelerate development of suitable habitat.

The analysis assumed that in the future non-federal lands would have no suitable habitat. This is an admittedly pessimistic assumption, but it is likely that it would be true of the vast majority of those lands.

Current acres of spotted owl habitat and future owl habitat projected for the district, by alternative, are shown in Table 4-19, Figure 4-20, and Appendix 4-17. The data is subdivided by physiographic province, of which there are four in Oregon with spotted owl habitat: the Oregon Coast Range, the Western Oregon Cascades, the Eastern Oregon Cascades, and the Klamath, which also includes much of northern California

(Thomas, et al. 1990; USDI 1991). The planning area occurs within the Coast Range, Klamath, and Western Oregon Cascades provinces.

Since the NA is not mapped in BLM's GIS data base, habitat data could not be calculated for it, but its outcome would be similar to that of alternative B.

Effects on Suitable Habitat within Roseburg District

Habitat conditions for spotted owls would change over time under all alternatives. Under all alternatives except E suitable habitat would decline on BLM-administered land over the short-term and out through the first five decades. Between the fifth decade and one hundred years all alternatives would experience some recovery in the amount of suitable habitat, although the levels for alternatives NA, A, and B would be minor. Only alternatives C and E long-term would result in significant increases above current levels of suitable habitat. Alternatives D and PA would experience declines of 14 percent long-term. The amounts of suitable habitat provided long-term by alternatives NA, A, and B would not be expected to maintain clusters of owls sites, sites occupied on a consistent basis or sites with blocks of adequate acres. In the long term under alternatives NA, A, and B, spotted owl populations would depend solely on habitat located on U.S. Forest Service lands for survival. Changes in suitable habitat by alternative is shown in Figure 4-19.

Alternatives C,D,E, and PA would provide suitable habitat in the long term, although only D and PA are specifically designed to provide areas where clusters of sites would be maintained. At one hundred years alternative C provides the greatest acreage of suitable habitat. This results from the management prescription which calls for regeneration harvests of younger stands for the first three decades. This results in a wave of suitable habitat becoming available between 70 and 100 years in the future. This phenomenon along with the assumption that high retention harvest remains suitable habitat, results in a high level of suitable habitat (Again, the untested nature of alternative C management indicates a lower level of confidence in this analysis). The effects of this wave would be

Table 4-19. Suitable spotted owl habitat within the Roseburg District Area by alternative (1000 acres)

		ALTERNATIVES					
Decade/Province	[1]Current	A	B	C	D	E	PA
After 10 yrs							
Coast Range	64	42	45	55	59	64	57
Klamath	66	44	46	53	62	66	54
W. Cascades	77	44	48	65	69	78	63
Total	**207**	**130**	**139**	**173**	**190**	**208**	**174**
After 50 yrs							
Coast Range		5	17	27	52	72	51
Klamath		9	19	30	56	76	51
W. Cascades		9	19	30	48	85	42
Total		**23**	**55**	**87**	**156**	**233**	**144**
After 100 yrs							
Coast Range		7	20	116	57	96	62
Klamath		13	25	119	71	103	70
W. Cascades		12	24	137	51	118	45
Total		**32**	**69**	**372**	**179**	**317**	**177**

[1] Current habitat includes 47,000 acres of Habitat 1 in the Coast Range Province: 42,000 acres of Habitat 1 in the Western Cascades Province; and 24,000 acres of Habitat 1 in the Klamath Province.

diminished over time and eventually acres of suitable habitat would stabilize at a level below alternative E but above alternative D and PA.

In alternative C the suitable habitat in the long term would be generally distributed throughout the planning area. It is possible that larger blocks would occur around the R and R blocks or within the corridors, but there is no way to determine precisely how the habitat would be distributed in the landscape. Approximately 68 percent of the suitable habitat under this alternative would be in managed forest stands, under either the high or low retention regimes.

Alternative E would result in the largest amounts of suitable habitat in the long term. In this alternative only 12 percent of the forest lands within the planning area would be available for timber management. Suitable habitat would dominate across the planning area with unsuitable habitat only occurring on the more scattered BLM lands and in patches on the larger blocks. The vast majority of suitable habitat would be in unmanaged stands.

Alternatives D and PA would provide approximately 56 percent as much suitable habitat in the long term as alternative E (see Table 4-19). This amounts to 45 percent of the forested land base. Under alternative D approximately 60 percent of the suitable habitat would occur within the HCAs. In the PA, 61 percent would occur within the OGEAs. This relative concentration of habitat within large areas would result in a lower degree of habitat fragmentation within the HCAs and OGEAs. It also implies that suitable habitat outside these areas would be more scattered and more fragmented than in alternatives C and E. The habitat within the HCAs in alternative D would be essentially unmanaged. Within the OGEAs of the PA approximately 25-35 percent of the habitat would be subject to density management harvests. The intent of these harvests would be to accelerate the development of old-growth forest characteristics, which should also enhance spotted owl habitat.

In conclusion, all alternatives, except E, reduce the amount of suitable habitat available in the short term. The short term habitat loss is most acute in alternatives NA, A and B.

Alternatives NA, A, and B would provide very little suitable habitat in the long term with no attempt at clumping the acres. Alternatives D and PA would provide less total suitable habitat in the long term than currently available. Alternative D and PA would concentrate more suitable habitat in large areas to minimize fragmentation, while alternatives C and E would distribute suitable habitat across the landscape.

The effects of habitat projections under the alternatives on owl populations are discussed later in this section.

Effects on Suitable Habitat within Western Oregon

Based on the data in the Draft Spotted Owl Recovery Plan, BLM-administered lands currently provide approximately 14 percent of the suitable owl habitat in the region (Washington, Oregon and, northern California), compared with 74 percent on Forest Service lands (USDI, Fish and Wildlife Service 1992:34). In Oregon approximately 25 percent of suitable habitat occurs on BLM lands; 70 percent on Forest Service lands.

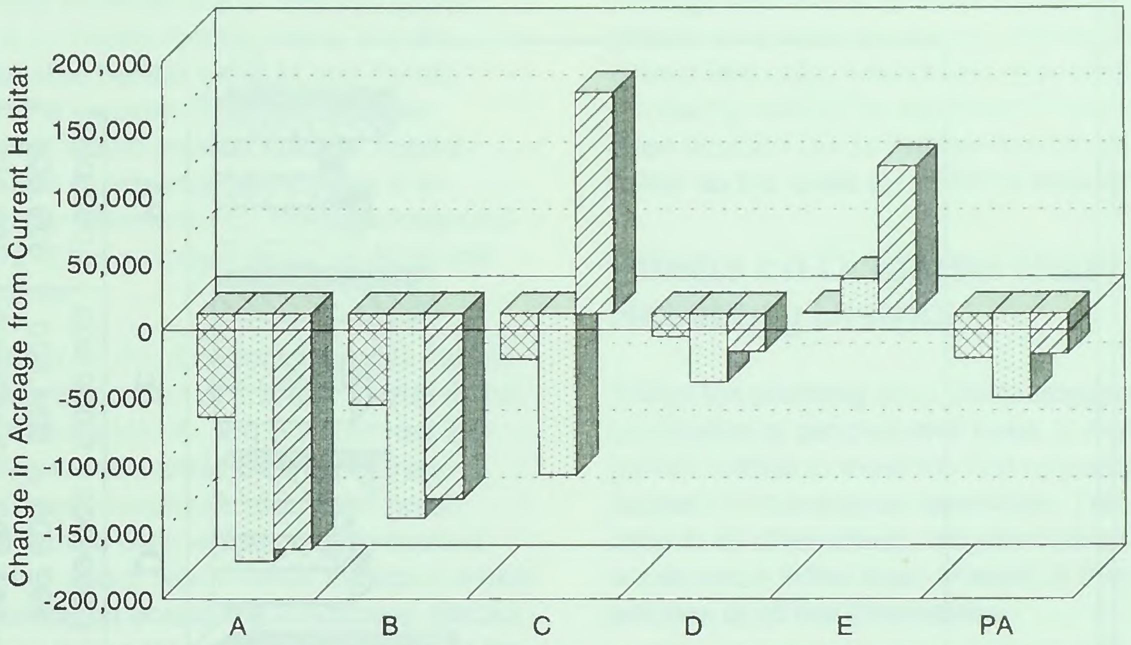
The projections shown in Figure 4-20, 4-21, and Appendix 4-18 indicate that in western Oregon, Alternatives NA, A, and B would provide the least suitable habitat in the short and long term. Compared to the amount projected for Forest Service lands, under these alternatives BLM would not contribute substantial habitat for spotted owls in the state.

Alternative C would provide the greatest amount of suitable habitat in the long term, but would only be approximately 43 percent as much as is projected for Forest Service lands. Alternatives E, PA, and D would contribute smaller acreages; 38, 31, and 30 percent of the Forest Service projections, respectively. The actual percentages on BLM lands in Oregon are higher than those calculated since the Forest Service projections include suitable habitat in the California portion of the Klamath province.

The contribution of BLM lands to the present and projected availability of suitable habitat in the different provinces varies substantially (see Appendix 4-18). BLM lands are most important in the Coast Range, where BLM lands currently contain more suitable habitat than Forest Service lands. Under alternatives NA, A, and B suitable habitat on BLM lands would be reduced 51-74 percent from current acres within the Coast Range province and provide 33-62 percent as much suitable habitat as Forest Service lands.

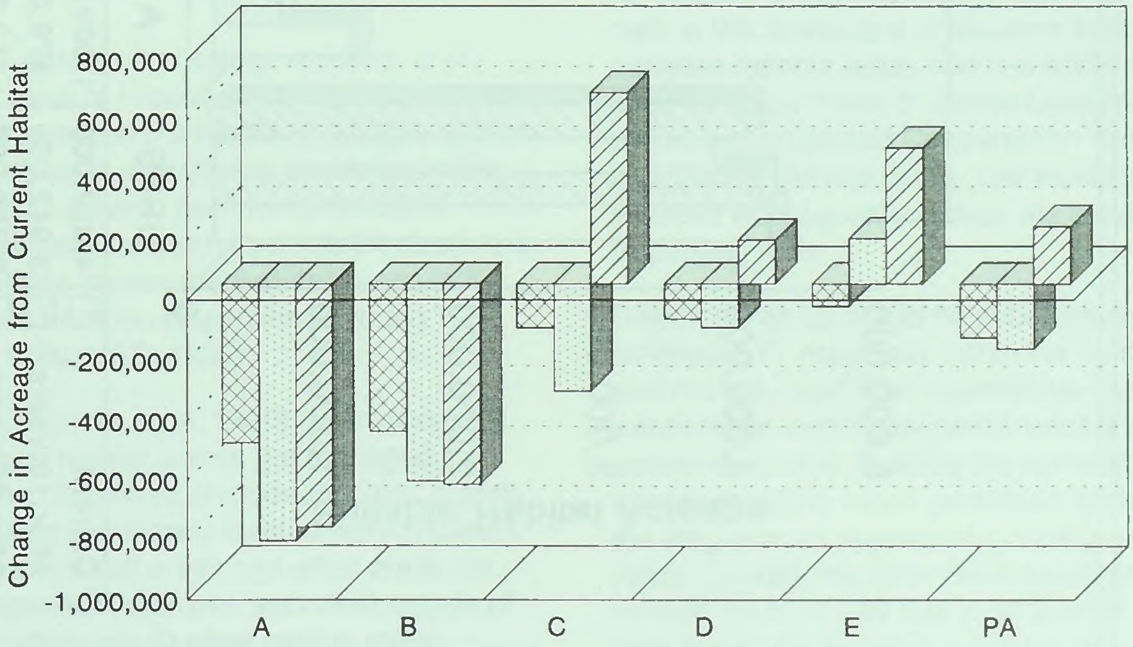
In the long term, BLM lands under Alternative C would produce 80 percent more suitable habitat compared with the existing situation, which is more than twice as much as is projected for Forest Service lands. Alternatives D, E, and the PA would be between these two extremes within the Coast Range province, and provide between 60 to 64 percent of the suitable habitat on BLM and Forest Service lands.

Figure 4-19. Changes in Suitable Spotted Owl Habitat by Alternative
All Provinces - BLM Lands - Roseburg District



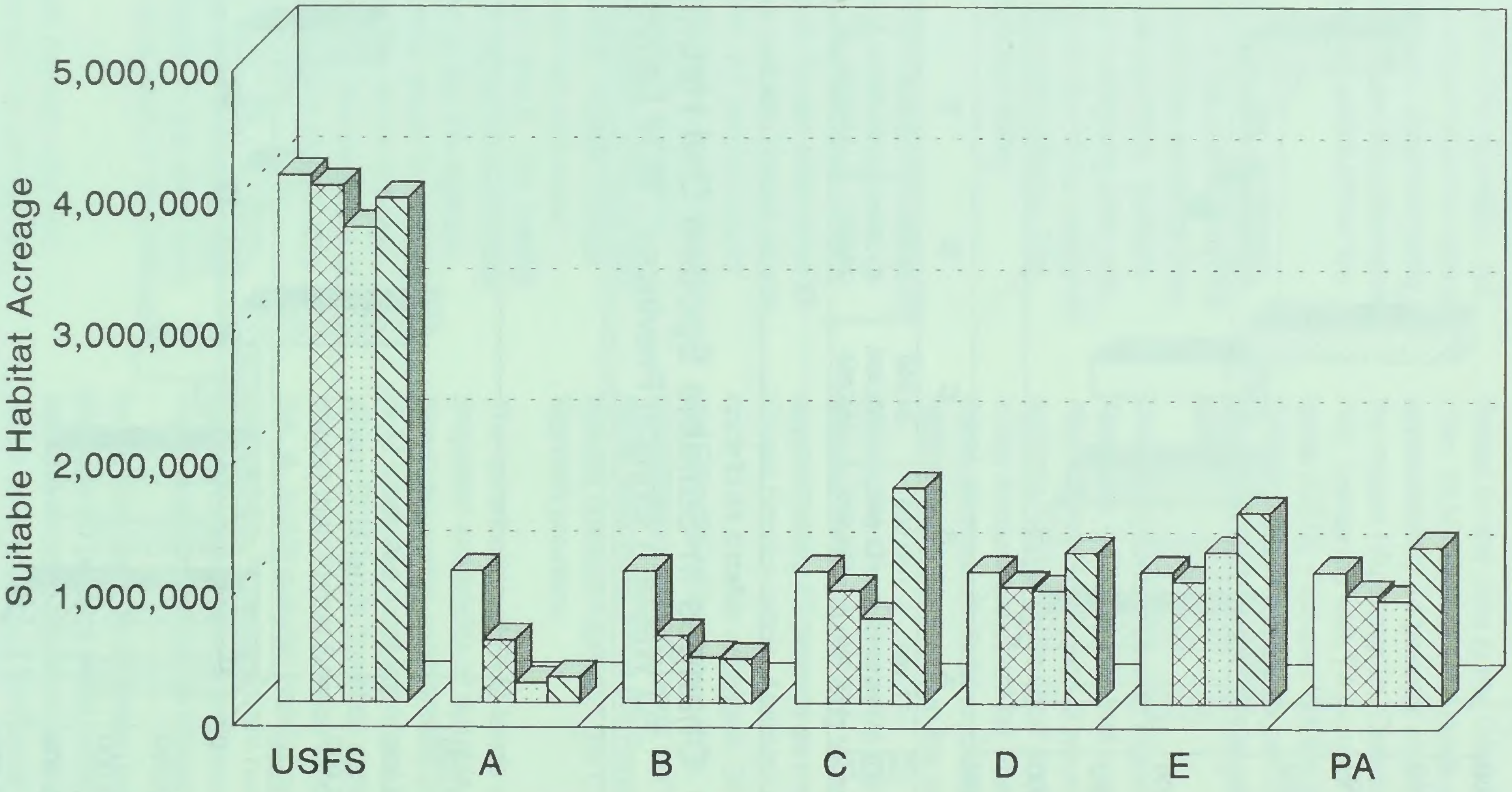
	A	B	C	D	E	PA
After 10 years ☒	-77,000	-68,000	-34,000	-17,000	1,000	-33,000
After 50 years ☐	-184,000	-152,000	-120,000	-51,000	26,000	-63,000
After 100 years ▨	-175,000	-138,000	165,000	-28,000	110,000	-30,000

Figure 4-20. Changes in Suitable Spotted Owl Habitat by Alternative
All Western Oregon Provinces - BLM Lands



	A	B	C	D	E	PA
After 10 years ☒	-530,000	-493,000	-147,000	-117,000	-75,000	-179,000
After 50 years ☐	-857,000	-659,000	-358,000	-145,000	151,000	-216,000
After 100 years ▨	-811,000	-670,000	638,000	146,000	454,000	192,000

Figure 4-21. Total Suitable Spotted Owl Habitat
Western Oregon - USFS and BLM Lands by Alternative



		USFS	A	B	C	D	E	PA
Current	☐	4,022,000	1,009,000	1,009,000	1,009,000	1,009,000	1,009,000	1,009,000
After 10 years	☒	3,942,000	479,000	516,000	862,000	892,000	934,000	830,000
After 50 years	░	3,625,000	152,000	350,000	651,000	864,000	1,160,000	793,000
After 100 years	▧	3,848,000	198,000	339,000	1,647,000	1,155,000	1,463,000	1,201,000

USFS 10-year data prorated between current and 50-year projection

Within the other provinces the relative contribution of BLM lands to suitable spotted owl habitat in the long term compared with Forest Service lands is smaller than in the Coast Range. In the Klamath province BLM lands would provide suitable habitat ranging from 62,000 acres under Alternative B to 596,000 acres under Alternative C. These correspond to 3 to 24 percent of the suitable habitat on BLM and Forest Service lands. In the western Oregon Cascades province BLM lands would provide suitable habitat ranging from 50,000 acres under alternative A to 454,000 acres under alternative C. These correspond to 3 to 20 percent of the suitable habitat on BLM and Forest Service lands.

At least as important as the amount of suitable habitat is the distribution and location of suitable habitat in the landscape. Alternatives NA, A, and B would result in widely scattered, generally small patches of fragmented habitat. These conditions also favor great horned owls and barred owls which prey on spotted owls. Alternatives C and E would result in habitat which is also evenly distributed across the landscape. Blocks of habitat would be larger than in NA, A, and B and the blocks would be closer together which would facilitate movement between blocks. Alternatives D and the PA would concentrate more habitat into large blocks (HCA or OGEA). This promotes clusters of owl nests relatively close to each other to ensure successful movement of individuals between territories. These large blocks are also designed to be close enough to each other to permit successful dispersal of owls between blocks (Thomas, et. al. 1990; USDI 1992).

Effects on Dispersal Habitat

Habitats 1 and 2 provide for nesting, roosting, and foraging habitat. Also of importance is the condition of dispersal habitat between the blocks of suitable habitat where nesting habitat is expected to be concentrated. Provision of forest habitat to permit movement of juvenile and adult owls between nest habitat clusters is important to facilitate replacement of deceased individuals by recruits from the dispersion of young (Thomas, et al. 1990; USDI 1992).

The ISC report (Thomas, et al. 1990) determined that adequate dispersal habitat across the managed landscape had two important component parts: stands of high quality old-growth forest located within riparian buffer strips, sensitive soil areas and other areas not available for timber management; and other stands of forested habitat which would allow owls to move across the landscape and find some level of security until they found blocks of unoccupied suitable habitat.

The "50-11-40" rule was developed by the ISC to define a prescription for management of dispersal habitat (Thomas et al. 1990). It calls for maintaining at least 50 percent of the land outside nesting habitat clusters in a forested condition where stands have an average tree size of at least 11 inches dbh and canopy closure of at least 40 percent. Although it is based on limited field data, it has been used as a method for assessing habitat for dispersal of spotted owls. It has been decided to use quarter-townships (nine square miles) as the scale on which to assess this standard.

Effects on Dispersal Habitat within Roseburg District

Within the planning area, there appears to be adequate distribution of patches and strips of high quality old-growth habitat to meet the first requisite of dispersal habitat in most quarter townships. This would be the case in all alternatives, but alternatives NA, A, and B would result in the least amount of these habitat patches of all the alternatives.

The forest land outside of these patches and strips would vary dramatically across the alternatives. Alternatives NA, A and B would very likely result in most, or all, of the quarter townships within the planning area not meeting the 50-11-40 rule. This is due to the large amount of acreage available for timber management and a 60 year rotation cycle. Under these alternatives dispersal habitat would be attained approximately 40 years after regeneration harvest. It is also important to note that under these alternatives large blocks of suitable habitat would not be available for clusters of nesting owls. It would be necessary for owls in this landscape to disperse long distances between reserve areas such as wilderness areas and large category 1 and 2 Habitat Conservation Areas (HCA) or Designated Conservation Areas (DCA) on U.S. Forest Service lands. The increased distances involved would greatly reduce the survival rates of dispersing owls.

Dispersal habitat would be substantially better under alternative C, especially within the corridors where R and R blocks and high retention silvicultural regimes would retain existing dispersal habitat and develop additional habitat. Outside the corridors the low retention regime would contribute to dispersal habitat in the long term as regenerating stands aged beyond 40 years. Overall, this alternative would probably meet or exceed the 50-11-40 rule in all quarter townships only after five or six decades. As in the previous alternatives, dispersing owls would be moving greater distances between clusters of pair sites than in alternatives D and PA. Generally, the quality of the habitat owls would be dispersing through would also be better. It would not only meet the 11-40 criteria, but in many instances would also meet the criteria for level Habitat 1 or Habitat 2. Some of the R and R blocks under alternative C would be large enough to support successful pairs, but these would not be the large blocks called for in the ISC report.

Alternative D is essentially the ISC report recommendations and would require compliance with the 50-11-40 rule when planning timber harvest. Currently there are 75 quarter townships, out of a total of 243 within the planning area, which do not meet the 50-11-40 rule. Under this alternative this number would decline until essentially all quarter townships met the 50-11-40 rule in three decades. At that time only eight quarter townships would require a total of 224 acres for total compliance. The distance which owls would be required to disperse across the managed landscape would be much less under this alternative than any previous alternative due to the presence of the large Category 1 and 2 Habitat Conservation Areas. This along with the improved dispersal habitat conditions, would result in higher dispersal success rates.

Alternative E contains so little land available for timber harvest that dispersal habitat is likely to recover similarly to alternative D and ultimately exceed the 50-11-40 rule on the majority of quarter townships. In most cases, the condition of the dispersal habitat would be far superior than the minimum levels found in alternative D. The occasional quarter township not meeting the rule would likely occur along the valley fringes and contain below average BLM ownership.

The results of the quarter townships in relation to the 50-11-40 rule under the preferred alternative are displayed in Appendix 4-16. Only the PA was specifically analyzed for effects on dispersal habitat. To approximate conditions under alternative D, a sensitivity analysis was conducted which constrained violating the 50-11-40 rule.

Dispersal habitat conditions improved in the short-term under the PA, but then declined below current conditions for 30 years before recovering in the fifth decade. The number of quarter townships not meeting the 50-11-40 rule and the total number of additional acres needed for all quarter townships to meet the rule is displayed in Appendix 4-16.

The significance of meeting the 50-11-40 rule is not only a function of the number of quarter townships but also where they are located on the landscape and the number of acres needed to meet the rule. In the Roseburg planning area the general pattern of quarter townships not meeting the rule is in a circle around the interior valleys. These quarter townships tend to be on the forest fringe and contain fewer BLM acres. There are some significant exceptions to this pattern. Of the 75 quarter townships currently not meeting the rule, ten are within connectivity corridors, 16 are adjacent to OGEAs and a total of 3,777 additional acres would be required for all quarter townships to meet the rule. Within the connectivity corridors dispersal conditions continue on a improving trend with only two quarter townships remaining below the rule by 100 acres after two decades. Overall, and primarily within the GFMAs, dispersal conditions do not track as favorably. During the third and fourth decades the respective deficiencies are 20 and 24 quarter townships adjacent to OGEAs and 22,890 and 24,573 additional acres required to meet the rule in all quarter townships.

Not meeting the 50-11-40 rule on the total number of quarter townships, the locations of some quarter townships adjacent to OGEAs and total acres short of meeting the rule indicate dispersal conditions will be less favorable for the first 40 years under the PA as compared to alternative D. By the fifth decade, under the PA dispersal habitat conditions will have improved over the present with only nine quarter township adjacent to OGEAs not meeting the rule. Only one of these quarter townships would be deficient by over 100 acres and the total for all nine would be 813 acres. For all quarter townships to meet the rule in the fifth decade a total of 5,508 additional acres (two percent) would be required.

In conclusion, alternatives NA, A, and B would result in the least effective dispersal habitat conditions of all the alternatives. Alternatives C, D, E, and the PA would all satisfy the 50- 11-40 rule in the long term, but alternatives C and E provide more total acres. In addition, it appears that in alternatives D most quarter townships would be managed at the minimum level necessary to maintain 50 percent dispersal habitat on BLM-administered lands. Although the PA would take longer for all quarter townships to meet dispersal habitat, the quality and quantity above 50 percent would ultimately exceed alternative D. This would be particularly true within the connectivity corridors.

The cumulative effects on dispersal habitat are perhaps more significant than the specific effects of any one alternative. The ISC originally developed the 50-11-40 rule as a standard to evaluate dispersal habitat across the landscape. This approach works well in the case of the U.S. Forest Service where there is contiguous federal land ownership. However, over much of the planning area, the BLM administers only half of the forest lands. Unless other land owners contribute to dispersal habitat it is probable that even if the BLM attains 50 percent dispersal habitat on federal lands, the overall landscape would contain 25 percent dispersal habitat.

This would result in a much lower rate of successful dispersal than would occur if 50 percent of the total landscape provided dispersal habitat. Whether it is adequate to provide for successful dispersal of owls between suitable nesting areas is unknown. This situation was recognized by the ISC (Thomas 1990:327) when they recommended that the 50-11-40 rule be prorated by ownership for the first three years and then be re-evaluated "as it applies to multiple-ownership areas".

Effects on Dispersal Habitat within Western Oregon

The cumulative effects on dispersal habitat are perhaps more significant that the specific effects of any one alternative. As mentioned earlier, the 50-11-40 criteria were origianlly developed as a standard to evaluate dispersal habitat across the landscape. Given the checkerboard ownership pattern across most of the planning area, it is probable that even if the BLM attains 50 percent dispersal habitat on federal lands, the overall landscape would not contain more than 25 percent dispersal habitat in most situations.

A sensitivity analysis of dispersal habitat on all BLM-administered lands in western Oregon was conducted for the preferred alternative (Appendix 4-16). Two projections were made, one using the timber harvest modeled for the PA, and another in which timber harvest maintained 50-11-40 conditions. The latter projections approximate the conditions under alternative D. A total of 1,411 quarter-townships in western Oregon contain BLM lands; 22 of these would never meet the 50-11-40 standard, leaving 1,389 which have the potential to develop those conditions.

The results indicate that under alternative D, dispersal habitat would steadily improve from the existing condition and would fully meet the 50-11-40 standard in all 1,389 quarter-townships within 40 years. Under the PA it would take longer because in some planning areas a short rotation harvest age would allow harvest of stands too early to enable the landscape to fully meet the 50-1-40 criteria (see Appendix 4-16).

Effects on Populations

Description of the analytical model

The primary tool used for analysis of impacts on northern spotted owl populations is the population model developed by the USDA Forest Service's Pacific Southwest Research Station, Redwood Sciences Laboratory, Arcata, California (McKelvey, et al. in press). This model is generally referred to as the McKelvey Model. It is a spatial model that simulates the fluctuation of spotted owl populations in a landscape changed by forest management, by modeling behavior of all individuals within the population. The functioning of this model and the assumptions used in its analysis of effects of the alternatives are described in Appendix 4-19 and 4-20.

This model represents a substantial revision and update of the model used in the 1990 analysis by the ISC, in preparation of its Conservation Strategy for the Northern Spotted Owl (Thomas et al. 1990). As published (Kingsolver, et al. in press) the model has been peer reviewed. The model's current analytical assumptions are better validated than the original ones due to recent research and monitoring data not available at the time that strategy was written. Although the parameters used to guide the model are based on recent and ongoing research, behavior inevitably becomes greatly simplified within the model. Like most analytical models that attempt to project natural resource outcomes, this model has not been fully validated by research and its predictive capability is uncertain. This uncertainty does not negate its usefulness as a tool for comparison between alternative management approaches but makes it least certain regarding the absolute numbers derived. There are three key parameters on which the model is based:

- Definition of suitable habitat.
- Percent of suitable habitat in a polygon (hexagon) of approximately 2,500 acres considered necessary for a pair to successfully nest, reproduce and survive.
- The spatial arrangement (clumpiness) of polygons that meet the preceding standard. The spatial arrangement and quality of suitable habitat within a polygon, however, are not addressed.

The model does not address owl dispersal using the 50-11-40 rule. Rather it evaluates owl movement between hexagons based on the amount of suitable habitat and occupancy of the hexagons. The model treats all suitable habitat (Habitats 1 and 2) as equal.

All polygons with 30 percent suitable habitat were assigned a pair of owls to distribute initial occupancy of available habitat. The initial population levels in the model are lower than the current actual population. Since the model is most effective in predicting relative differences between the alternatives over time, the initial number of owls is insignificant in the long term and doesn't effect the outcome of the model.

The interaction of National Forest habitat is reflected in the owl population model. In the owl model, national forest habitat was assumed to remain stable in Designated Conservation Areas (DCA) identified in the draft spotted owl recovery plan (USDI USFWS 1992). Suitable habitat elsewhere in national forests was assumed to decline by 10 percent per decade until it reached 15 percent within each polygon.

Two sets of assumptions were used based on demographic responses to habitat thresholds (see Appendix 4-19). The first set, based on available data, assumes that hexagons with at least 60 percent suitable habitat would result in stable demographic parameters. This condition can rarely be met in a landscape where BLM administers only approximately 50 percent of the land. Therefore, a second assumption set was also analyzed. The second set is similar to the first, but assumes that only 40 percent suitable habitat is necessary to achieve these reproductive rates.

An attempt was made to validate the model by examining habitat and population trends from 1960 to the present. Habitat conditions in 1960, 1970 and 1980 were estimated based on birth dates of harvest units and assumptions of habitat depletion on private lands. Results indicate a general approximation of the spotted owl population and trends shown through recent inventories.

Results of the model

Planning Area Results

Projected carrying capacity for owl pairs for the planning area are shown in Table 4-20. Alternatives NA, A, and B would result in virtually no spotted owls persisting within the planning area in the long term. The projected populations for the planning area would decrease for 70 years using both rule sets for Alternatives C, D and the PA, except for a slight increase for alternative E using Rule set 2 see Appendix 4-19). Under the conservative assumptions (Rule set 1) only alternative C would make a significant improvement between 70 and 100 years. This reflects the large amount of suitable habitat which becomes available as discussed earlier in this section. Under the more optimistic assumptions (Rule set 2) alternatives C,D,E, and PA all improve between 70 and 100 years. At this time carrying capacity at 100 years has only been run for alternatives D and PA. In the long term alternative D and PA would have carrying capacities higher than the current using Rule set 2, but under under Rule set 1 both alternatives would result in lower carrying capacity at 100 years.

Table 4-20 Carrying Capacity (mean owl pairs) of Spotted Owls for the Roseburg District Area

	Alternatives						
	NA	A	B	C	D	E	PA
Rule Set 1 (Conservative Assumption)							
Current Carrying Capacity [1]	36						
Carrying Capacity at 10 Years	9	7	9	14	13	17	14
Carrying Capacity at 100 Years [1]	*	*	*	*	21	*	28
Rule Set 2 (Optimistic Assumption)							
Current Carrying Capacity [1]	53						
Carrying Capacity at 10 Years	22	23	22	37	42	47	42
Carrying Capacity at 100 Years [1]	*	*	*	*	58	*	70

[1] No change in habitat and model run for 100+ years.

* To be provided at a later date.

Western Oregon Results

The model results for western Oregon show a consistent and pronounced population decline for all alternatives for approximately 60 years. There are two major reasons for this decline. First, the recent widespread reduction of habitat in western Oregon has already reduced the amount of habitat below the point where it can support the population which currently exists. Secondly, the decline mirrors the projected loss of habitat on U.S. Forest Service lands outside the HCAs, along with additional losses on BLM lands.

The model results for the western Oregon situation in the long term shows that the population begins to stabilize under all alternatives. Alternatives A and B would result in very little suitable owl habitat on BLM-administered lands, therefore the population numbers projected by the model for these alternatives are largely a result of the habitat provided on U.S. Forest Service lands, the bulk of which would be within their HCAs.

Cumulative Effects

The cumulative effects of land management activities on spotted owls is dominated by the widespread removal of habitat on private and federal lands within the past 20-30 years and the trend toward short rotation management on private lands. Private timber cutting has special significance for BLM lands because of the intermingled land ownership pattern.

The other major factor is the plans developed by the U.S. Forest Service for management of their lands. Their recent final spotted owl EIS (USDA Forest Service, 1992) identifies the current habitat situation which is summarized in Table 4-21.

Table 4-21. Known spotted owl pairs; and nesting, foraging and roosting habitat.

Region	Habitat Acres	Known Owl Pairs
(WA, OR CA)[1]	8,204,000	3,461
USFS	6,073,000	2,420
Oregon	4,119,000	1,974
USFS	2,895,000	1,330
BLM	1,031,000	541
Other	193,000	103

[1] Not reported by state.

The Forest Service's spotted owl management decision would, according to their final EIS (USDA, FS, 1992), reduce region-wide habitat on national forests by a net acreage of eight percent over the next fifty years but, with the aging of retained stands, the net reduction would be only one percent at the end of 100 years. At the end of 150 years there would be 12 percent more spotted owl habitat on national forest land than there is currently, but it would be distributed differently. In Oregon, the amount of habitat would decline more in the first 50 years and would increase only slightly after 150 years. According to their EIS the Forest Service's decision is expected to provide long term spotted owl habitat and habitat capability as shown in Table 4-22. Habitat capability is defined by the Forest Service as the potential number of pairs. As with BLM's conclusions they note that its primary utility is for relative comparison of alternatives.

Based upon available data from the USDA Forest Service (1992) shown in Table 4-22 and from the output of the McKelvey Model utilized by BLM, the carrying capacity after 100 years for Forest Service and BLM lands within the range of the northern spotted owl would range from 2099 to 2277 under D, and 2118 to 2344 under the PA. Values for alternative C and E were not calculated in a manner that permitted the estimation of carrying capacity at 100 years, but they would be expected to fall above or within the range represented by the above values. The values presented represent the capability of the land to support the number of pairs specified and should not be interpreted as the exact number of pairs present at a given point in time.

A significant reduction or elimination of the interchange of individuals between sub- populations can bring about isolation (Thomas, et al. 1990). This isolation could affect genetic variability and the replacement rate of deceased individuals. The mechanics of isolation relative to spotted owls are not well understood, but would probably first be exhibited by lower replacement rates which would lead to a decreasing population size. The decrease in population size could then lead to loss of genetic variability over time, leading to adverse effects on the population's health. Isolation may be a factor affecting the population in the long term under Alternatives NA, A and B, but is not thought likely to be a factor under alternatives C, D, E, and PA.

The contribution of BLM-administered lands in the planning area to regional spotted owl viability is important due to the planning area's location at the juncture of the Coast Range, Klamath, and Western Cascades provinces and the bridge those lands provide between national forests.

Table 4-22 Expected National Forest spotted owl habitat and habitat capability.

Area	Habitat (acres) 100 Years	Habitat (acres) 150 Years	Habitat Capability (pairs) 100 Years	Habitat Capability (pairs) 150 Years
Region	6,025,000	6,781,000	2,544	1,894
Oregon Cascades	1,763,000	1,979,000	1,013	644
Klamath (including California)	1,840,000	2,116,000	851	604

The Forest Service's EIS concluded that their decision would maintain viable spotted owl populations on national forest lands in all provinces but assumed that BLM-administered lands would provide linkages to permit owls in the Oregon Coast Range to freely interact with owls in other provinces, and maintain the owl population in the north portion of the Oregon Coast Range.

The model's conclusions, based on both rule sets indicate that this opportunity would not exist under alternatives NA, A, and B. It does appear, however, that the other alternatives would provide some level of linkage and interaction between provinces. Alternatives D and PA would maintain HCAs or OGEAs comparable to the HCAs on Forest Service land. Between these areas, both these alternatives would provide for dispersal habitat consistent with the 50-11-40 rule after four to six decades. Alternatives C and E would provide approximately the same number of owl pairs in the long run, but the spatial distribution of these pairs could be different. Rather than being clustered in HCAs, the owls could be distributed more evenly across the landscape. It appears, however, that all four of these alternatives would meet the assumptions in the Forest Service's EIS.

Conclusions

Analysis of the information on population levels and the quantity and arrangement of suitable habitat on the landscape indicated that the alternatives would likely have different outcomes for sustaining owl populations on BLM in western Oregon and contributing to the long term stability of populations within the range of the owl. For alternatives NA, A, and B the outlook for sustaining owls on the BLM lands is near zero, thus increasing the risk to the overall population stability in the region. For alternatives C, D, E, and PA, the likelihood of sustained populations on BLM lands in concert with the management strategy adopted by the Forest Service varies as a result of two factors. These are the amount of suitable habitat required to sustain a given pair and the occurrence of suitable and dispersal habitat in space and time. If spotted owls require habitat configurations that yield 60 percent or greater suitable habitat for a given pair area then the likelihood of sustained populations of owls on BLM lands under any of the alternatives is low. This is not so much a product of management prescriptions, but rather a reflection of ownership patterns. The majority of the lands the Bureau administers occur in a checkerboard pattern that would yield only a 50 percent habitat condition if all the lands were suitable habitat. It is not physically possible to satisfy a 60 percent habitat requirement in a land ownership pattern which is in the checkerboard, alternate section arrangement of most of the BLM-administered lands of western Oregon.

If in fact the level of habitat required by a given pair is below 60 percent then the Bureau's land pattern will afford opportunity to provide sustained populations on a regional level under alternatives C, D, E, and the PA. The level of success in doing so will vary by alternative depending upon the second factor; the arrangement of suitable and dispersal habitat in space and time. As these habitat features vary both within and between alternatives so will the risk in attaining a given contribution to the overall population stability.

The risk associated with each varies because of the amount and distribution of suitable habitat and/or the amount and distribution of dispersal habitat in the first several decades of implementation. Alternative D carries the same level of risk to successfully contributing to the overall regional stability as would implementation of the plan recommended by the Interagency Scientific Committee (Thomas, et.al.,1990). In comparison, the risk increases for implementing alternative PA followed by alternatives C and E. The level of risk associated with the alternative PA as compared to D is slightly higher resulting from the departure observed in availability of dispersal habitat in the initial decades. In the long term, the preferred will exceed alternative D in amount of suitable habitat and the overall habitat capability. The increased risk under alternative C results from the expectation that silviculture will be successful in recreating habitat over large portions of the landscape and the use of smaller suitable habitat blocks. Under alternative E the allocations perpetuate the habitat conditions of today and do not afford opportunity for regrowth of habitat in areas presently deficient, thus reducing the amount of the range that can be successfully occupied in the long term.

Effects on Special Areas

Protection of special areas varies with each alternative (Table 2-5). The Little River Arch ONA would not be designated under any alternative except the NA alternative since the natural features for which the area was originally designated were determined not to meet ACEC qualification criteria. The natural feature for which this special area was originally designated would not be impacted under any alternative.

The natural features in three existing special areas and one of the potential special areas would be protected under other authorities in all of the alternatives regardless of ACEC designation. The North Umpqua River ACEC is completely included in the North Umpqua Wild and Scenic River Corridor. All of the natural features which qualify the area for ACEC status would be preserved under the authority of the 1968 Wild and Scenic Rivers Act. The natural features found in the Brad's Creek and Golden Bar ACECs and the Umpqua Wildlife Area potential ACEC would be protected under the 1973 Endangered Species Act, the 1918 Migratory Species Act, the 1906 Antiquities Act, and the 1979 Archeological Resources Protection Act. Failure to

Table 4-23. Adverse Impacts to Special Areas by Alternative.

Special Area	Proposed Designation	Alternative	Impacts
Bear Gulch	ACEC/RNA	NA, A, B	Failure to represent one cell in the ONHP[1]
Beatty Creek	ACEC/RNA	A	Failure to represent one cell in the ONHP
			NA, B Loss of potential riparian representation and diversity of upland vegetation
		NA, B	Potential impacts from mining and adjacent logging and road construction
Brad's Creek	ACEC		No anticipated impacts any alternative
Bushnell Irwin Rocks	ACEC/RNA	NA,A, PA	Failure to represent two cells in the ONHP. Irreversible impact to two ONHP cells (oak-madrone-conifer woodland and first to third order stream in Umpqua valley)
		B	Failure to represent one cell in the ONHP
		NA,B	Potential impacts from mining and adjacent logging and road construction
Golden Bar	ACEC		No anticipated impacts any alternative
Myrtle Island	ACEC/RNA	A	Failure to represent one cell in the ONHP
North Myrtle Creek	ACEC/RNA	NA,A,B	Failure to represent one cell in the ONHP
		NA,B	Potential impacts from mining and adjacent logging and road construction
North Umpqua River	ACEC		No anticipated impacts any alternative
Red Ponds	ACEC/RNA	NA, A, B	Failure to represent one cell in the ONHP
Tater Hill	ACEC/RNA	A	Failure to represent one cell in the ONHP
		A, B	Potential impacts from mining and adjacent logging and road construction
Umpqua River Wildlife Area	ACEC		No anticipated impacts any alternative

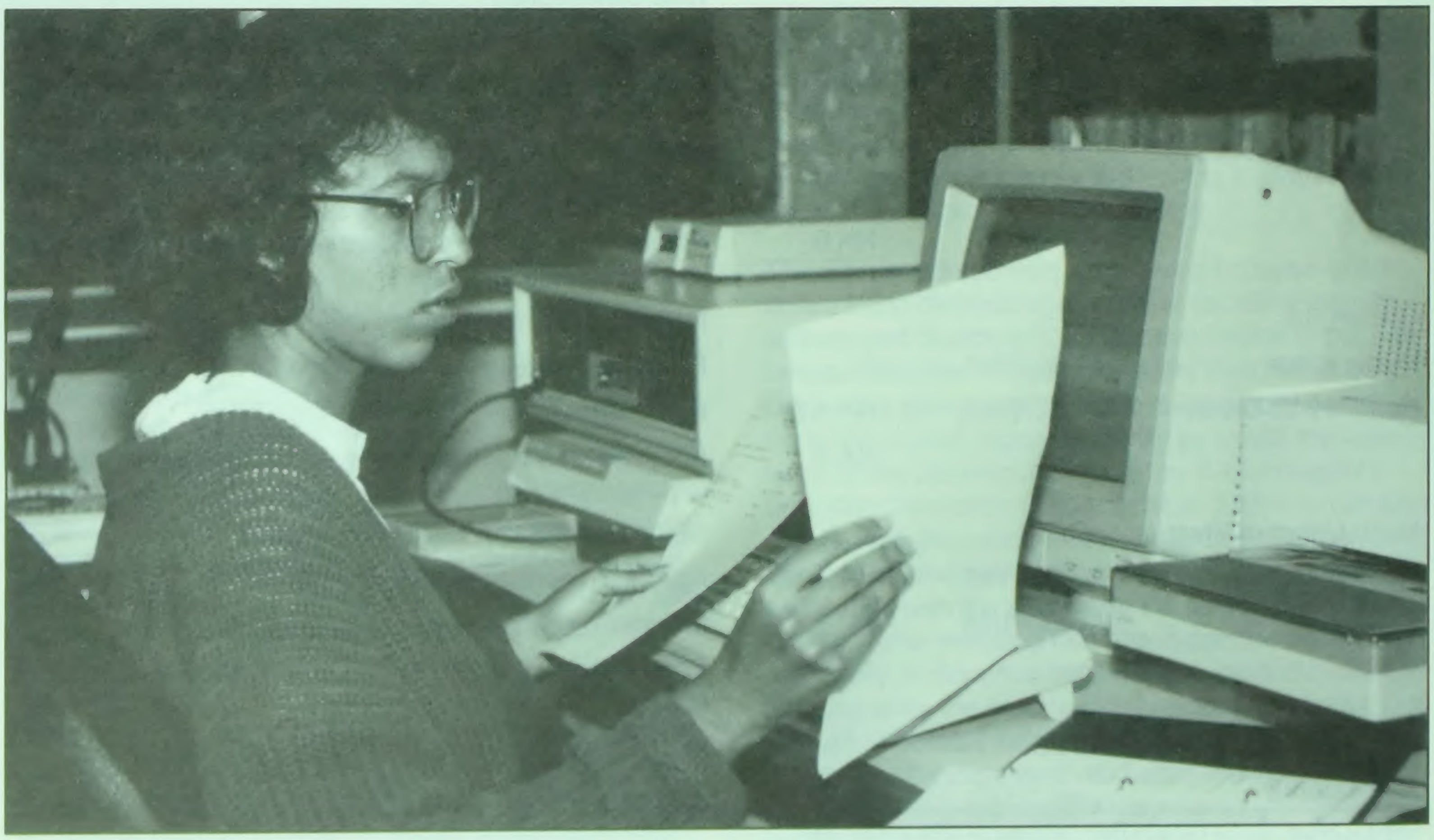
[1] ONHP=Oregon Natural Heritage Plan mandated by ORS 273.561-591

designate potential and existing RNAs in alternatives NA, A, B, and PA would withhold protection from RNA cells listed in the Oregon Natural Heritage Plan (Natural Heritage Advisory Council and The Nature Conservancy 1988). These cells are not known to be adequately represented at other locations. Failure to protect these RNA cells would reduce biological diversity and decrease research and educational opportunities on district lands. Limiting research could diminish the quality of future management on lands allocated for commodity use.

The preferred alternative would not designate the Bushnell-Irwin Rocks potential ACEC/RNA. The natural features which qualified this special area for ACEC/RNA status would not be protected in this alternative resulting in an irreversible and irretrievable commitment of resources. A summary of adverse impacts to all special areas under each alternative is provided in Table 4-23. Under the preferred alternative, the area proposed for designation as the Bushnell-Irwin Rocks ACEC would be allocated to timber production expect for TPCC withdrawls and designated RMAs. The management of this area for timber production would be an irreverisible and irretrievable adverse impact on the natural features of an oak-madrone-conifer woodland in the Umpqua valley and a first to third order stream system in the Umpqua valley which met the criteria of relevance and importance in the nomination process.

Logging could impact ACEC/RNAs designated in alternative B and the no action alternative. Even though logging would not occur inside designated boundaries in those alternatives, adjacent logging could impact the RNA cells these special areas are intended to protect. Logging is known to affect adjacent plant communities for distances of up to 600 feet by changing environmental parameters such as light, temperature, relative humidity, and soil moisture and by reducing the amount of soil mycorrhizae (Harris 1984, Harvey et al. 1980). Adjacent logging would also increase exposure of forest stands inside ACEC/RNAs increasing the potential for windthrow. The potential of wildfire in special areas caused by escapements exists when prescribed fire is used for disposal of slash in adjacent logging units. Grass mulching after logging and road construction would increase the potential for the introduction of exotic species. Construction of roads to adjacent units would increase the potential for unauthorized ORV use and the unauthorized harvesting of miscellaneous forest products. Boundaries have been configured in alternatives C, D, E, and the preferred alternative to mitigate these impacts.

Special areas designated ACEC/RNAs are not proposed for mineral withdrawal in alternatives A and B. Mining of locatable, salable, and leasable minerals within or adjacent to these special areas could impact the natural features the areas are intended to protect. Special areas designated solely as ACECs are not



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proposed for withdrawal from mineral entry in any of the alternatives but are not located in areas of significant mineral potential. No impact from mining is anticipated in these special areas under any alternative.

Effects on Cultural Resources

The potential for adverse impacts on cultural resources varies with the amount of surface disturbing activity permitted under each alternative. Since the most severe adverse impacts to cultural resources result from timber harvesting and associated road construction, alternatives NA, A, and B which emphasize timber harvest have the highest potential for adversely impacting cultural resources. Alternatives C, D, E, and PA which emphasize reduced timber harvest and allocate more land to such non-disturbing uses such as old-growth blocks and Riparian Management Areas have a reduced potential for adversely impacting cultural resources. Other ground-disturbing activities contributing to adverse impacts are recreation developments, mining, and construction and maintenance of utility corridors. Consequently, alternatives that emphasize these activities will also contribute to the deterioration of the resource base.

Slight positive impacts will accrue from the information gained from inventory and mitigation work associated with high disturbance alternatives. However, low disturbance alternatives will result in a higher level of positive impacts, primarily in the form of the preservation of information. RMAs may be especially beneficial to the preservation of cultural resources because of the correlation of important cultural resources and water sources. Affirmative measures common to all alternatives, such as interpretation, law enforcement monitoring, and non-compliance inventory and evaluation, will also result in positive impacts.

However, some adverse impacts will occur regardless of which alternative is selected for implementation, due in large part to natural deterioration and erosion.

Effects on Visual Resources

Clearcutting, road construction, and most other timber management practices change vegetative patterns, alter species composition, alter the land surface, and thereby cause visual impacts. The severity of an adverse visual impact depends on many factors, including type of harvest; location, number, size and shape of cutting units; yarding method; location and design of roads; amount and treatment of logging slash and road construction debris; and visibility of disturbed areas. The pre-treatment condition (i.e., scenic quality) of a viewshed is also a determining factor. Other land disturbing activities can also alter the landscape. Powerlines, new recreation sites, microwave relay sites, and drilling platforms are all examples of other activities which alter a viewshed. Generally, viewsheds that are noticeably altered can be further modified with less adverse visual impact than viewsheds with little or no visible alteration. In some situations, visual impacts from management practices can be beneficial. Examples are the removal of dying or dead trees, thinning foreground vegetation to create pleasing views, and the manipulation of contrasting cutting boundaries, especially on ridgetops.

In each of the alternatives the Visual Resource Management (VRM) classes and management objectives differ from the inventory classifications of areas shown in Map 3-5. The VRM classes and objectives of an alternative are designed to fit into the overall resource management emphasis of the alternative. Revisions of the inventory classes were either downgrades (e.g., class II to IV) or upgrades (e.g., class II to I). An alternative which upgrades VRM inventory classes would provide more restrictive management objectives (i.e., less vegetative disturbance) for affected areas. Downgrading would have the opposite effect and, consequently, may result in a high level of vegetative disturbance in affected areas. The effect of downgrading might be to lower the scenic quality of affected areas. However, BLM's ability to affect an area's overall scenic quality depends to a large extent on land ownership patterns. In more than 60 percent of the areas inventoried, non-BLM lands and management practices dominate the landscape, and this may have a greater effect on overall scenic quality than activities on downgraded BLM-administered lands.

Table 4-24 shows probable changes in visual resource conditions in the short term due to management activities under each alternative.

Under all alternatives, no adverse changes in visual resource conditions are expected on approximately 4,200 acres of BLM-administered land listed below because they would be managed to meet VRM inventory standards.

Special Areas	**Recreation Site**
Beatty Creek	Susan Creek
Myrtle Island	Mill Pond
Brads Creek	Rock Creek
Tater Hill	Cavitt Creek
North Myrtle Creek	Scaredman
Golden Bar	Tyee
North Umpqua Wild and Scenic River	Gunter Wayside
Little River Arch ONA	Recreation Gold Pan Area
Red Pond EEA	North Bank Swiftwater
	North Umpqua Wild & Scenic River
	Lone Rock Boat Launch
	E-mile

On the remaining acres of BLM-administered land, changes in visual resources conditions would vary by alternative because of downgrading and upgrading of inventory classes.

Under the No Action alternative, general visual resource conditions on BLM-administered land would continue in a moderate decline due to VRM Class IV management of lands inventoried as VRM classes II and III and continuation of the management directions established in 1983.

Alternative A would be the most detrimental alternative for visual resources due to VRM class IV management of areas inventoried as VRM classes II and III. Approximately 16,600 acres (20 percent) of these downgraded areas would be planned for timber harvest in the 10-year period. A significant impact on visual resources would occur in the short term due to widespread vegetative disturbances.

Under alternative B, VRM class IV management would be applied to areas inventoried as VRM classes II and III except those areas within one-quarter mile of highly sensitive areas such as major highways. Approximately 11,100 acres (18 percent) of these downgraded areas would be harvested in the 10-year period, and adverse visual impacts would occur.

Under alternative C, inventoried VRM class II areas which fall within areas managed for 15 to 20 percent basal area retention would in essence be managed as VRM class III. Approximately 4,200 acres of these downgraded areas would be harvested in the 10-year period, and adverse visual impacts would occur.

Alternative D would benefit visual resources because all lands would be managed to inventory standards. Scenic quality would be maintained or improved on BLM-administered lands.

Alternative E would be the most beneficial alternative for visual resources because it would provide for the least amount of vegetative disturbance. Unharvested areas would be maintained at inventory class conditions or better. All high value scenery and sensitive viewing areas would be protected from noticeable disturbance. The condition of areas with moderate to low value scenery and/or low sensitivity would improve

Table 4-24. Probable changes in visual resource conditions in the short term

Inventoried VRM Class	Existing Condition[1]	Visual resource condition changes[2]						
		NA	A	B	C	D	E	PA
I	good	0	0	0	0	0	+	0
II	good	-	-	-	0	+	+	0
III	fair	-	-	-	+	+	+	+
IV	poor	0	0	0	+	+	N/A	+

[1] Condition estimated by district landscape architect based on field observations.
Good = slightly altered viewsheds with scenic value
Fair = moderately altered viewsheds
Poor = highly altered viewsheds with low scenic value

[2] + = beneficial, 0 = none or negligible, - = adverse. Ratings of change (+, -, 0) represent the anticipated effect of timber management and other commodity development on existing visual resource conditions, taking into consideration: (1) VRM class objectives for affected areas; (2) probable effects of upgrading/downgrading; (3) land ownership patterns and adjacent land uses, and (4) level of timber harvest and other commodity development within the next 10 years. (See Chapter 2 Visual Resources Management Common to All Alternatives for background information regarding ratings.)

Table 4-25. Probable Short-Term Changes in Outstandingly Remarkable Value Conditions for Study River Segments Under Each Alternative.

Study River Name	Highest Potential Classification	Value[1]	Probable Changes by Alternative[2] NA	A	B	C	D	E	PA
Canton Creek	Recreational	Fish	0	0	0	0	0	0	0
Smith River	Recreational	Fish/Wildlife	0	0	0	0	0	0	0

[1] identified outstandingly remarkable values

[2] + = beneficial - = adverse

0 = none or negligible (see Appendix 2-10 for the rationale supporting these determinations of condition change)

in the long term because VRM IV areas would be managed to VRM III standards. However, there would be sharp contrast between intermingled ownership.

Under the preferred alternative, there would be approximately 46,000 acres which would be downgraded from VRM inventory standards (700 VRM II acres downgraded to VRM III, 28,000 VRM II acres downgraded to VRM IV, and 11,000 VRM III acres downgraded to VRM IV). Of the downgraded acres, approximately 4,200 acres would be harvested in the decade of this plan, and on these harvested acres there would be some unavoidable adverse impact. This impact would be partially mitigated on the 172,536 acres of general forest management area by the retention of six to eight live conifer trees per acre in all harvest units, and on the 81,966 acres of connectivity areas by retaining 12 to 16 live trees per acre on all harvest units. On the 153,449 acres of old-growth emphasis areas where regeneration harvests would be deferred for 80 years, there would be no adverse visual impact during this 80 year period, and as existing clearcut units revegetate, the visual resource on these lands would be enhanced. Appendix 4-8 shows the managment direction and consequences of managing visual resources under each alternative.

Effects on Wild and Scenic Rivers

River-related values within approximately one-quarter mile of the existing Congressionally designated North Umpqua River Wild and Scenic River would not be significantly impacted by BLM resource management activities, as their riverine values would be fully protected under all management alternatives.

Interim management would be implemented under all alternatives to fully protect river-related values of the three river segments (Cow Creek, South Umpqua River, main stem Umpqua River) determined to be eligible for inclusion as components of the National Wild and Scenic Rivers System, but which are not being studied for suitability in the RMP. This interim protection would continue pending resolution of the wild and scenic river issue involving these eligible river segments. The following environmental consequences discussion relates solely to the two BLM-administered river segments (Smith River and Canton Creek) being studied for suitability in the RMP.

To be eligible for inclusion as a component of the National Wild and Scenic Rivers System, a river or river segment must be in a free-flowing condition and possess at least one river-related value determined to be outstandingly remarkable. These two Congressionally established criteria are used to judge changes in resource conditions, particularly adverse changes. If resource management activities inherent to a specific alternative would alter flow characteristics of a study river segment, or degrade the segment's river-related outstandingly remarkable values (ORV), the change created by the actions allowed under that alternative would be adverse.

Addressing first the impacts of BLM resource management activities on flow characteristics, none of the alternatives include management activities that would adversely affect the free-flowing condition of the two study river segments (Canton Creek and Smith River). However, under alternatives where a river or river segment is found to be unsuitable for inclusion as a component of the National Wild and Scenic Rivers System, an externally proposed project, such as a dam, could be proposed. However, Section 10 (a) of the Federal Powers Act requires Federal Energy Regulatory Commission (FERC) to consider consistency with federal or state comprehensive plans for improving, developing, or construction a waterway prior to issuing licenses. Licensing by FERC is restricted because of inconsistency with the Northwest Power Planning Council (NPPC) "protected area" designation.

Designation would give congressional protection from hydroelectric development of the study segment, however, development is essentially foreclosed already under current regulations.

The impacts from BLM resource management activities under all alternatives would not cause changes in the river related values in the short term. Table 4-25 shows probable short-term changes in the ORV conditions of each of the seven study river segments by alternative. The rationale supporting these determinations of condition change is presented in the separate suitability assessment for each study river (Appendix 2-10).

Fish was identified as the sole ORV for both Canton Creek and Smith River. As shown in Table 4-19, short-term changes to the fish-related ORV of these stream segments would not occur under any alternative.

Outside the protective land allocations prescribed under the NA alternative, most BLM-administered lands within the two study river corridors would be managed for timber production consistent with a variety of other uses. In terms of timber harvest, the no action alternative is most similar to alternative B. The ten year scenario analysis for alternative B, which may be applied to NA, indicates that approximately 1,000 acres could be harvested in these corridors during the life of the plan (see Introduction to this chapter for discussion of the 10 year scenario analysis). Under NA, riparian bufffers would be approximately 100 feet on each side of third order streams. Most of the large woody debris required for proper stream function would be provided (Murphy and Koski 1989). First and second order perennial or intermittant streams would not receive protection under the NA alternative. An adverse impact to water quality in these streams would be increased temperature and sedimentation. The flow from these streams would cause an adverse impact to both river segments. Peak flow events would be transported immediately from first and second order drainages to both study river segments. Although the following discussion outlines some adverse impacts that would occur under alternatives NA, A, B, and C, none of the impacts would be sufficient to cause an adverse change to the fish ORV or effect the eligibility status and highest potential classification of Canton Creek and Smith River segments.

Outside the riparian management areas (RMA) prescribed under alternative A, most BLM-administered lands within the two study river corridors would be managed for timber production. The 10 year scenario analysis indicates that approximately 1,600 acres could be harvested and approximately five miles of road could be constructed in the corridors.

Outside the RMAs prescribed under alternative B, most BLM-administered lands within the two study river corridors would be managed for timber production consistent with a variety of other land uses. The 10 year scenario analysis indicates that approximately 1,100 acres could be harvested and approximately three miles of road could be constructed that would occur in these two corridors. Under this alternative riparian management area width would not provide sufficient large woody debris in the long-term to third order and smaller streams. The fish ORV would experience a slight adverse impact due to slightly elevated water temperature, and an increased potential for channel scouring. Under alternative B, the riparian management area width would not provide sufficient large woody debris in the long term and would preclude development of optimum conditions.

Riparian management areas under alternative C would provide sufficient protection to the third order and larger streams. The smaller riparian management area width protection provided to first and second order streams in the two study segments would result in an adverse impact to water quality, but because of the very small areas affected by harvest activity (10 year scenario analysis indicates a possible harvest of approximately 20 acres in Canton Creek and approximately 150 acres in Smith River) the affect on the fishery ORV would be minimal or non-existent.

Under alternatives D, E, and PA short-term management activities would not impact the eligibility status of either Canton Creek and Smith River. The lower harvest level along with the riparian management areas provided for under these alternatives would result in no adverse impact on the fisheries ORV.

Under the preferred alternative there would be no long term impacts that would cause a degradation of the fish ORV to a less than outstandingly remarkable condition.

Effects on Recreation

Recreationists visit BLM-administered lands to gain satisfying outdoor activity experiences. They accomplish this by participating in recreation activities within preferred surroundings or settings. The broadest segment of visitors will realize quality experiences when there is available to them a real choice among a diverse set of outdoor recreation opportunities. The degree to which a particular alternative would either beneficially or adversely affect a visitor's outdoor recreation experience depends on the management actions involved. Management actions which tend to improve opportunities for visitors seeking one form of recreation may diminish opportunities for visitors seeking other forms, since activity participation requirements and expectations vary so greatly from one recreation user group to the next. The primary impacts of BLM resource uses and management practices on recreation (e.g., timber harvest, construction of roads and structures, and mineral development) are related to changes in settings. These may be physical alteration of resources available or new and different opportunities for social interaction with other forest visitors. They may also be regulatory actions such as road closures and limits on the length of time visitors may stay in a particular area or site. These setting changes affect the type and distribution of recreation opportunities available on BLM-administered lands, the levels and patterns of visitor use and, ultimately, the quality of recreational experiences desired by the visiting public. For example, use of a recreation management area might be increased by new road construction. Under this circumstance, the setting condition change would provide more and easier access, allow use of recreation vehicles and equipment not previously possible in an unroaded setting, or foster additional social interaction among the area's visitors. On the other hand, use of the area for recreation purposes may temporarily or permanently decline if the area's overall setting is altered to the point where desired recreation experiences can no longer be realized by visitors. When experience expectations of people cannot be satisfied in a particular area, their natural inclination is to shift their use to other BLM-administered lands or to areas administered by other public or private entities.

Dispersed recreation activity on BLM-administered lands throughout the planning area would increase, as visitor demands for such use increases, under all alternatives. Although levels of use might change from alternative to alternative, the differences are considered minor. Of particular relevance is the fact that BLM-administered lands and waters and the transportation system providing access to them are extensive and would not be used to capacity during the short-term period for many preferred activities under any alternative. Even alternatives C, D, and E, which would limit motorized vehicle use to major roads in many areas, would continue to provide more than adequate opportunities for public participation in many of the dispersed recreation activities with no appreciable deterioration in experience quality, and could provide a higher quality hunting experience for some hunters.

Table 4-26 shows anticipated short-term capability of BLM-administered facilities and resources to meet projected recreational demand for 11 major use categories by alternative.

Under the no action alternative (NA), projected demand would be met for all recreation uses in the short term with four exceptions. "Demand for other land-based use" activities, which includes picnicking, would probably not be met in certain locations in the district because of an absence of developed picnicking facilities. Particularly at the south end of the district, there are few opportunities under the NA alternative for the public to picnic in developed sites. Development of such sites at various man made ponds scattered throughout the southern end of the district was not included as a part of the 1983 land use plan under which BLM is currently operating. Demand for camping would not be completely met in certain locations because of the current absence of campground facilities in those locations. Demand for boating activities would likewise probably not be met under this alternative. There is a need to develop additional boat launch facilities, and the 1983 MFP did not completely identify and address this need. Nonmotorized travel use, primarily that related to developed trail systems, would not be met since several potential trails capable of handling hiking, backpacking, horseback riding, and mountain biking were not included as part of the 1983 land use plan. Management actions carried out under the NA alternative, however, are not expected to adversely affect the experience expectations of forest visitors either for preferred dispersal recreation activities or for activities dependent on developed recreation facilities.

Projected demand would not be met for several recreation uses in the short term under alternatives A and B. During the 10 year period it is possible that some prescribed management activities, primarily the estimated 3,235 timber harvest units totaling 74,040 acres under alternative A, and the estimated 2,924 timber harvest units totaling 65,553 acres under alternative B, could adversely affect visitor experience expectations to the point that participation in some preferred recreation activities would be sought on lands managed by other government agencies or the private sector. Neither of these alternatives includes an allocation for lands covering the Cow Creek SRMA, or its associated potential recreation sites and facilities.

Under alternative A all ten existing high use recreation sites and all five high use trails would continue to be managed for recreation. No additional facilities or trails would be developed. Projected demand for facility-dependent activities would not be completely met other than for those dispersed recreation activities requiring additional miles of road access. Demand for ORV use would be met in most areas, however it would not be met on approximately 800 acres of land along the

Table 4-26. Anticipated Short-Term Capability of BLM-Administered Facilities and Resources to Meet Projected Recreational Demand for 11 Major Use Categories by Alternative.

Recreation Use Category[1]	Projected Demand (in Visits for Year2000)[2]	Anticipated Capability to Meet Demand:						
		NA	A	B	C	D	E	PA
Off-road travel (e.g., driving motorcycle, ATV and 4X4 vehicles off the road)	74,200	yes	yes	yes	yes	no	no	no
Motorized travel (e.g., sightseeing and exploring)	126,500	yes	yes	yes	yes	yes	yes	yes
Nonmotorized travel (e.g., bicycling, day hiking/backpacking and horseback riding)	168,800	no	no	no	no	yes	yes	yes
Camping	71,500	no	no	no	no	yes	yes	yes
Hunting	48,900	yes	yes	yes	yes	yes	yes	yes
Other land-based use (e.g., picnicking, studying nature and viewing wildlife)	148,400	no	no	no	no	yes	yes	yes
Fishing	75,500	yes	yes	yes	yes	yes	yes	yes
Boating	21,500	no	no	no	yes	yes	yes	yes
Other water-based use (e.g., swimming, general waterplay, tubing)	25,200	yes	yes	yes	yes	yes	yes	yes
Winter sports (e.g., cross-country skiing, snowshoeing and sledding/snowplay)	0	NA	NA	NA	NA	NA	NA	NA
Snowmobiling	0	NA	NA	NA	NA	NA	NA	NA
TOTAL	**760,500**							

[1] Source USDI - Bureau of Land Management, Recreation Management Information System.

[2] Extrapolated from Hospodarsky, Denver. 1989. The Pacific Northwest Outdoor Recreation Consumption Projection Study Oregon Project, Final Report. Oregon State University.

south bank of the North Umpqua River between the Narrows and the BLM/USFS boundary which would remain closed to ORV use.

Under alternative B, all existing recreation sites and trails would continue to be managed for recreation. In addition, three new recreation sites would be added. Projected demand for facility-dependent activities would not be completely met other than for those dispersed recreation activities requiring additional miles of road access. Demand for ORV recreation use would be met in most areas, however, this use would not be allowed in 800 acres along the south bank of the North Umpqua River, and in 3246 acres of lands designated as ACECs. Under both alternatives A and B, parts of the district (generally the north end) would continue to meet most of the recreation demand. However, the south end of the district which currently has little in the way of recreation development, would fail to meet a growing need for facility-dependent activities.

Under alternative C, projected demand would be met for most recreation uses in the short term with three exceptions. "Other land-based use", which includes picnicking, would probably not be met in certain locations in the district because of an absence of developed picnicking facilities. Particularly at the south end of the district, there are few opportunities for the public to picnic in developed sites, and this situation would continue under alternative C. There is also a growing need for group reservation camping facilities which would not be met under alternative C. Nonmotorized travel use, primarily that related to developed trail systems, would still not be met since several potential trails capable of handling hiking, backpacking, horseback riding, and mountain biking would not be proposed for development under alternative C. Demand for ORV recreation use would be met in most areas, however, this use would not be allowed in 800 acres along the south bank of the North Umpqua River, in 3246 acres of lands designated as ACECs, and in 170 acres of lands occupied by special status plants. It is anticipated that management actions carried out under this alternative would not adversely affect the experience expectations of forest visitors, either for preferred dispersed recreation activities or for activities dependent on developed recreation facilities.

Under alternatives D, E, and PA, projected demand for all recreation uses in the short term would be met except for dispersed recreation activities related to off-road travel (driving motorized vehicles off of the network of forest roads). Road closures and off-road travel limitations in many areas would decrease visitor participation in these activities; however, visitor participation in activities not usually compatible with intensive off-road use would increase. Hunting on foot, hiking, horseback riding, studying nature, and viewing wildlife are all activities that would be benefited by selective road closures and off-road travel restrictions in areas which provide these opportunities. Other than off-road travel activity in selected areas, it is anticipated that management actions carried out under these alternatives would not adversely affect the experience expec-

Forest Road

tations of most forest visitors, either for preferred dispersed recreation activities or for activities dependent on developed recreation facilities.

Effects on Timber Resources

Each of the alternatives described in Chapter 2 would affect BLM's timber resource and its availability for harvest in a different way. The management decisions contained in the final plan will directly affect the manner in which the age, size, type, distribution, and productivity of district timber stands change over time. These characteristics of the forest, in turn, help determine the non-declining even flow, as well as the size and quality of timber that will be available for harvest.

The allowable sale quantity (ASQ) under all alternatives would be based on the objective of providing a non-declining even flow of forest products. The ASQ level would depend on the number of acres allocated to the various levels or intensities of timber management, the sustained yield capacity of those acres, and the initial volume and age-class distribution of the timber. Thus, non-declining yield may be constrained by any of the following:

- Allocations established for the benefit of other resources
- Economic feasibility of management on specific tracts
- Limitations on intensity of timber management
- Minimum harvest size or age standards

The TPCC system described in the timber resources section of Chapter 3 and in Appendix3-10 refers to the Suitable Commercial Forest Land (SCFL) and Suitable Woodland (SWL) categories. SCFL sites are judged to be suitable to manage for a sustained yield of commercial conifer species, and are included in the land base used for ASQ calculations under all alternatives, unless excluded for other reasons.

Some SWL sites may be capable of producing a sustained yield of forest products, but would generally require a longer regeneration period (due to reforestation problems) and/or a longer rotation (due to low site quality) to produce a commercial product. Other SWL sites are capable of producing a sustained yield of only noncommercial species. Under alternatives A, B, and C, some portions of the SWL sites are included in the ASQ calculations.

Some researchers suggest productivity, even on SCFL sites, may not be sustainable over the long term under an intensive management regime such as that proposed for alternatives NA, A, and B. Soil fertility may be diminished over time by repeated cycles of harvest, site preparation, and control of competing vegetation (Perry and Maghembe 1989).

In addition, the simplification of the ecosystem that is associated with an intensively managed forest may result in less resistance to insect pests and pathogens and less ability to adapt to changing environmental conditions, such as a potential long-term climate change or increased levels of air pollution (Franklin et al. 1989). The most intensive management would occur under alternatives NA, A, and B. Alternatives C and PA incorporate biodiversity considerations and alternatives D and E intensively manage decreasing portions of the land base respectively, compared to alternatives NA, A, and B.

The acreage of SCFL that is allocated for protection or management of non-timber resources varies among the seven planning alternatives. The allocation of lands to timber production determines how many acres would be available for harvesting. Table 2-1 displays the acres available for unconstrained timber production by alternative for each category of suitable woodland and suitable commercial forest land.

The TRIM-Plus computer harvest scheduling model was used to produce an estimate of the ASQ for each alternative and for many of the sensitivity analyses. Empiric yield tables (derived from the timber inventory) provided the initial volume of existing stands, and the ORGANON, a computerized stand growth and yield simulator, generated yields for future managed stands.

For each of the basic land use allocations and most of the management prescriptions, the TRIM-Plus model projected the age, size, and cubic foot volume of timber that could be harvested each decade for up to 40 decades. In the case of alternative C, and the OGEAs and connectivity areas under the preferred alternative, these projections are more speculative than the ASQ projections for the other alternatives. The prescriptions for alternative C call for retention of a portion of the stand at harvest, development of stands with multiple canopy layers, maintenance of wider tree spacing by means of a series of intermediate cuttings, and management on rotation lengths sufficient to attain old-growth structural characteristics. There is currently little available research that quantifies the expected timber yields from such stand management regimes.

Appendix 2-2 contains a brief description of the ASQ computation process. Appendix 4-1 describes the sensitivity analyses that were performed and displays their effects on the ASQ.

Table 4-27 Allowable Sale Quantity (ASQ) of the Alternatives

Alternative	MMCF	MMBF By Decade					
		1	2	3	5	10	20
NA	405	2470	2397	2185	1947	1836	1879
A	477	3150	3070	2810	2480	2340	2420
B	440	2910	2820	2570	2290	2160	2210
C	112	740	740	730	620	720	740
D	143	920	910	900	840	810	800
E	32	180	160	160	160	170	200
PA	163	1050	1040	1000	910	1000	1080

The ASQ would be greatest under alternative A and least under alternative E, with the ASQ for the other alternatives falling in between those extremes. Table 4-27 displays the ASQ produced by the TRIM-Plus model for each alternative. The ASQ is defined as an annual even flow quantity based on cubic foot measure; however, the board foot equivalent may decrease somewhat over time as progressively younger, smaller diameter stands are harvested. Board foot equivalents are shown for decades 1, 2, 3, 5, 10, and 20 of the plan.

Under alternative C, some timber harvest volume in addition to the even flow quantity calculated for the ASQ would be removed as partial cuttings from the blocks of land designated for restoration and retention of mature and old-growth forest. Partial cuttings from these blocks would be designed to accelerate development of old-growth structural characteristics in younger stands contained in the blocks.

Under the preferred alternative, OGEAs contribute to the even flow calculated for the ASQ through intermediate harvests (density management) designed to accelerate young stands to old-growth conditions and through regeneration harvests. However, regeneration harvests would be deferred for 80 years. In addition, owl pair sites located in the connectivity areas and general forest management area would contribute to the ASQ calculation. However, no harvesting in the owl pair sites (80 to 100 acres per owl pair site) would be conducted until biologists determined that the site had been abandoned. No harvesting in the owl pair sites is planned for the life of this plan.

Under alternatives NA, A, and B, the average age and diameter of harvested timber stands would decline over time, approaching the minimum harvest age specified for each alternative. Under alternatives C through E and the PA, the average age and diameter at harvest would remain about the same or increase as some stands are placed on longer rotations. Table 4-28 shows the average age at regeneration harvest by alternative and decade.

In alteratives NA, A, B, D, and E, the mimimun harvest age was allowed to be determined by the TRIM-Plus Harvest Scheduling model to optimize the ASQ level. In contrast, the minimum harvest age for the GFMA under the preferred alternative was assigned two configurations. A Culmination of Mean Annual Increment (CMAI) minimum harvest age, ranging from 80 to 110 years for the Roseburg District depending on stand type and treatments, was used for all future harvested stands and half of the existing managed stands. The remaining portion of the currently managed stands, those stands which have already been harvested and planted, were given a minimum harvest age of 60 years. The use of minimum harvest age set

Table 4-28 Average Age at Regeneration Harvest by Alternative and Decade.

	Decade				
Alternative	1st	2nd	3rd	5th	10th
NA	314	158	102	61	61
A	227	160	96	50	37
B	222	154	91	51	40
C	177	187	201	89	156
D	167	154	140	93	64
E	82	45	45	50	65
PA	164	176	171	91	127

to less than the CMAI for an individual stand allows the restructuring of the district's age class distribution. On any large forest resource land base maximizing yields over the long term under a non-declining even-flow scenario requires having a balanced age class distribution available for harvest scheduling. Without a balanced distribution of age classes the use of a CMAI minimum harvest age constraint could result in a much reduced ASQ level. The current age class distribution of the Roseburg District can be characterized as bimodal. To optimize yields under the preferred alternative, to balance the age class distribution in the GFMA, and to move towards attainment of a CMAI only minimum harvest age therein, requires the flexibility of a dual minimum harvest age class configuration in the harvest scheduling model for the short term.

Appendix 4-9 display volume and acres of final harvest by age class, for the 1st, 2nd, 3rd, 5th and 10th decades of the plan, for each of the seven alternatives.

Construction of new permanent roads, landings, and rock quarries would reduce the total acres of land available for timber production. Roads would be constructed to provide access to BLM timber sale areas and to adjacent non-BLM lands under the terms of right-of-way permits and reciprocal right-of-way agreements. The reduction in forest land acreage resulting from road construction would continue until all roads necessary to manage lands allocated to timber production are constructed. This length of time would vary by alternative.

The amount of land eventually taken up by permanent roads, which for practical purposes is considered an irreversible or irretrievable commitment of resources, would not be significantly different under any alternative except alternative E which would have the least road construction.

Table 4-29 displays total mileage of permanent roads, and the acres taken up by the road system, for the 1st and 5th decades of the plan, by alternative. The table reflects that the district would be fully roaded at the end of the 5th decade, except some minor amount of roading could be completed after the 8th decade in the preferred alternative, OGEAs.

Though dedication of land to permanent roads is an unavoidable adverse effect of timber management, the loss of timber production acres would be minimized by (1) careful advance planning to minimize the total length of road system needed, making effective use of available logging systems; (2) building roads to the minimum width required for the expected use of each road; (3) avoiding unnecessarily wide clearing limits in road design and construction; and (4) constructing temporary dirt spur roads, which are replanted after harvest, where permanent roads are not necessary.

Under all alternatives some live conifer trees would be left standing within harvest units to provide for wildlife habitat diversity. Retention of green trees results in a reduction in the ASQ. To maintain and improve the genetic base, some trees selected for retention under alternatives C and the preferred alternatives would be commercial conifers of good form as well as minor species, including hardwoods. If trees with poor form are retained, the seed they disseminate may carry undesirable genetic traits unless such trees are girdled or topped.

Table 4-29. Miles and Acres of Roads by Alternative

		Decade				Total Miles
		First		Fifth		When Fully
Alternative	Existing Miles	Acres	Miles	Acres	Miles	Roaded
NA	3,000	2,727	500	273	50	4,000
A	3,000	2,727	500	273	50	4,000
B	3,000	2,455	450	273	50	3,900
C	3,000	1,036	190	709	130	3,700
D	3,000	1,036	190	709	130	3,700
E	3,000	191	35	191	35	3,170
PA	3,000	1,173	215	654	120	3,700

Spread of the laminated root rot fungus, Phillinus weirii, would be favored by forest management regimes that emphasize timber harvest followed by prompt replanting of Douglas-fir, which is highly susceptible to Phillinus. This impact can be mitigated by replanting identified infection sites with tree species which are resistant or immune to the disease.

Intensive forest management practices would be implemented under every alternative, to some extent. However, under alternatives NA, A, and B, intensive practices would be applied to a greater proportion of the area than under the other alternatives. Table 4-1 displays the projected acres to which each practice would be applied, by decade and alternative. These acreage figures have been estimated for the purpose of analyzing potential environmental impacts. Actual acres of each type of harvest and stand treatment will vary in the course of implementation of the plan. Appendix 4-10 shows average acres treated by various practices by decade for each alternative.

Under alternatives NA, A, B, D, and the GFMA in the PA, genetically selected seedlings would be planted following regeneration harvest, to the extent that improved seed is available from the seed orchards. Under alternative C, and the OGEAS and connectivity areas in the PA genetically selected seedlings would comprise not more than half of the trees planted following regeneration harvest.

Artificial reforestation has the potential to change the genetic makeup of forest stands, regardless if the seed used has been produced through a genetic improvement program. If the genetic variation of the forest is decreased through use of genetically improved or other seed sources, this may reduce resistance of the trees to attacks of disease or insects or to changes in the environment.

However, tree selection and breeding programs are designed to prevent excessive narrowing of gene pools or the complete loss of genetic traits. Moreover, genetic improvement may provide the only viable method of protecting genetic material in species whose existence is threatened by plant diseases, such as the white pine blister rust.

Use of genetically improved trees should result in accelerated growth rates and earlier attainment of merchantable stem sizes, as well as more rapid development of old-growth type structure. Under alternatives NA, A, B, D, E, and in the GFMA in the PA, the ASQ would reflect anticipated future yield increases from genetically improved stands. See Appendix 2-4 for a more complete discussion of the effects of the tree improvement program.

Fertilization of managed stands would take place under all of the alternatives. Effects would include higher growth rates and earlier production of merchantable trees. Also, under alternatives NA, A, B, D, E, and in the GFMA under the preferred alternative the ASQ would reflect expected future gains resulting from fertilization.

Some type of intermediate harvest (commercial thinning or density management), is planned to occur under all of the alternatives on available forest sites where topography and road locations are suitable for partial-cut logging operations. When applied to young, well-stocked stands, thinnings can produce an increase in total net yield and permit a higher ASQ. The yield increase results from early harvest of merchantable trees which otherwise would have died and become unusable before final harvest of the stand. The increased ASQ results from the timing of intermediate harvests as well as from the higher total yield over a rotation. Depending on spacing of residual trees, thinning also can result in production of larger trees, higher stumpage values, and lower logging costs at regeneration harvest. Under alternative C and in the OGEAs and connectivity areas under the preferred alternative, density management of young stands would be used to maintain open canopy conditions and promote retention of mixed species, as well as to accelerate development of old-growth structure conditions and prepare the stands for regeneration harvest in the future.

Without careful implementation, thinning and density management can result in damage to tops, crowns, bark, and roots of residual trees, reducing wood quality and increasing the risk of insect and disease attacks. These stands may also be more susceptible to windthrow in some locations.

Precommercial thinning (PCT) would be applied to overstocked young stands under alternatives NA, A, B, D, E, and in the GFMA under the preferred alternative, on sites allocated to timber production where analysis indicates the practice would be economically feasible. Precommercial thinning (PCT) would be used for restoration silviculture under alternative C and in the OGEAs and connectivity areas under the preferred alternative, density management of young stands would be used to maintain open canopy conditions and promote retention of mixed species, as well as to accelerate development of old-growth structure conditions.

Some negative effects of PCT are at times evident. The increased vigor of stands which have received PCT may make the trees more susceptible to bark damage by bears in local areas. At times, PCT cutting assists the spread of the black stain fungus, especially in stands where soil compaction resulted from previous tractor logging.

Overall, PCT usually results in a small increase in the ASQ, allows earlier development of a merchantable stand, and provides an opportunity to control density and species conposition, and elminate poorly formed and diseased trees early in the life of the stand.

When land exchanges result in acquisition of lands that would be allocated to timber production, the nondeclining harvest level (the ASQ) could be increased. Conversely, any exchanges of commercial timberland for tracts which would be allocated to nontimber uses would result in a decrease in the ASQ. The types of land that would be considered for exchanges would vary by alternative.

Under alternatives B, C, D, E, and the preferred alternative, some BLM-administered lands would be allocated to receive special management practices due to the concerns of residents who live in close proximity. Such rural interface areas would produce a lower yield of timber than other BLM commercial forest lands because of limitations on vegetation management, clear cutting, and prescribed burning.

To retain recreation management options for future development of high value recreation sites and facilities, harvest of timber will not be allowed on these sites. The acreage involved varies by alternative, however, the most significant acreage is 1,620 acres in the North Umpqua Wild and Scenic River Corridor which would be withdrawn from lands allocated for timber production under all alternatives. The overall effect would be a slight decrease in the ASQ. Appendix 4-11 shows the summary effect of land use allocations on lands available for timber production.

Timber Supply

An analysis of the timber supply for the Roseburg District has been conducted by the Pacific Northwest Research Station (USDA Forest Service). That study modeled the timber supply from each of the ownership categories in western Oregon. Timber supply from BLM in the Roseburg District under each alternative was then included and overall economic timber supply for 1993-2000 was estimated. In this process the private timber supply was adjusted to account for price changes attributable to the different levels of BLM timber supply by alternative. Then a similar process was followed to estimate the outlook for the 2000-2010 period. The results are displayed in Table 4-30. Because this model has not been validated its predictive capability is uncertain.

Compared to the 1984-88 baseline period, total timber harvest in the Roseburg District would decline under all alternatives (see Table 4-30). The change in the timber harvest would range from -12 percent (alternative A) to -35 percent (alternative E). The decline in overall timber harvest in alternative A would result in spite of an increase in BLM timber harvests.

The timber supply analysis estimated the amount of timber which would be harvested in the district from all sources from 2001 to 2010 using the same assumptions as for the previous period. Total timber harvest increased under all alternatives even though BLM and National Forest harvest did not. However, it remained below the 1984-88 baseline.

Due to the fact that a portion of the raw logs harvested in the district is processed outside the district, the changes in available supply would affect areas outside the district also, but to a lesser degree. Similarly, these log flows affect the quantity of wood processed in the lumber and wood products industry in the district. Both inflows and outflows of logs affect the amount of wood actually processed in the district. Estimates of the amount of wood processed are shown in Table 4-30. Differences between the amounts processed under different alternatives may be attributed to the alternatives. The wood processing sector would consume less wood under all alternatives than during the reference 1984-88 period.

The cumulative effects of the alternatives are shown in Table 4-31. This table shows projected timber harvests in western Oregon based on the assumption that each BLM district adopts the same alternative. The table does not include harvests in Klamath County because BLM's share of total harvests there is very small.

Compared to the 1984-88 baseline, BLM harvests would range from an increase in alternative A (+25 percent) to a decrease in alternative E (-72 percent). Total harvests in western Oregon would decline under all alternatives, principally due to decreases in harvests on the National Forests. In the 2001-2010 time period total harvests would increase even though BLM and National Forest harvests would not.

Timber processed in western Oregon during 1993-2000 would decrease under all alternatives. The reader should note that logs exported overseas are not excluded from this total.

Table 4-30

Roseburg District Timber Harvest (1993–2000) per Year – Millions of Cubic Feet (MMCF) per Year

Supplier [1]	1984–88 Baseline	Alternative No Action	A	B	C	D	E	Preferred
BLM [2]	41	39	48	44	11	14	3	16
USFS [3]	63	41	41	41	41	41	41	41
Private (industrial & non–industrial)	79	74	73	74	76	76	76	76
Other Public	0	0	0	0	0	0	0	0
Total	184	155	162	159	128	131	120	133

Data source: Non–BLM harvest projections from Timber Supply Analysis for BLM Planning, USDA–USFS, PNW Research Station, Portland, OR, 1992.

Roseburg District Timber Harvest (2001–2010) – Millions of Cubic Feet (MMCF) per Year

	1984–88 Baseline	Alternative No Action	A	B	C	D	E	Preferred
Total	184	167	175	171	140	146	132	145

Data source: Non–BLM harvest projections from Timber Supply Analysis for BLM Planning, USDA–USFS, PNW Research Station, Portland, OR, 1992.

Roseburg District Timber Processed (1993–2000) – Millions of Cubic Feet (MMCF) per Year

	1984–88 Baseline	Alternative No Action	A	B	C	D	E	Preferred
Total	178	148	156	153	123	125	116	128

Note: (1) Timber Processed from all sources was partitioned on county boundaries to approximate the BLM District, with the exception of the coastal portion of Douglas County which was included in Coos Bay District. (2) This analysis accounts for historic patterns of log flows across county boundaries. (3) Assumes all BLM districts have implemented the same alternative. (4) Includes logs exported overseas.

Data Source: Timber Supply Analysis for BLM Planning, USDA–USFS, PNW Research Station, Portland, OR, 1992.

[1] Non–BLM supply partitioned to approximate BLM District. Excludes the coastal portion of Douglas County.

[2] Baseline data from BLM Facts, USDI–BLM. Converted from board feet using a factor of 6.2 bd. ft. per cu. ft.

[3] Assumes implementation of most recent land management plans.

Table 4-31

Western Oregon Timber Harvest (1993–2000) per Year – Millions of Cubic Feet (MMCF) per Year [1]

Supplier	1984–88 Baseline	Alternative No Action	A	B	C	D	E	Preferred
BLM	199	187	250	226	67	74	55	96
USFS [2]	377	175	175	175	175	175	175	175
Private (industrial & non–industrial)	602	689	679	682	704	703	706	700
Other Public	64	64	64	64	64	64	64	64
Total	1243	1114	1167	1144	1009	1014	998	1034

Data source: Non–BLM harvest projections from Timber Supply Analysis for BLM Planning, USDA–USFS, PNW Research Station, Portland, OR, 1992.

Western Oregon Timber Harvest (2001–2010) – Millions of Cubic Feet (MMCF) per Year

Total	1243	1224	1281	1259	1113	1122	1103	1140

Data source: Non–BLM harvest projections from Timber Supply Analysis for BLM Planning, USDA–USFS, PNW Research Station, Portland, OR, 1992.

Western Oregon Timber Processed (1993–2000) – Millions of Cubic Feet (MMCF) per Year

Total	1294	1166	1216	1195	1063	1069	1053	1087

Note: (1) Timber Processed from all sources was partitioned on county boundaries to approximate BLM Districts, with the exception of the coastal portion of Douglas County which was included in Coos Bay District. (2) This analysis accounts for historic patterns of log flows across county boundaries. (3) Assumes all BLM districts have implemented the same alternative. (4) Includes logs exported overseas.

Data Source: Timber Supply Analysis for BLM Planning, USDA–USFS, PNW Research Station, Portland, OR, 1992.

[1] Totals do not include Klamath Falls Resource Area.

[2] Assumes implementation of most recent land management plans.

Effects on Energy and Minerals

The allocations and management prescriptions of the alternatives may affect availability of land for exploration and development of energy and mineral resources, by imposing operating constraints on leasable, locatable and salable mineral activity.

To assess these effects, constraints have been divided into three categories: (1) closures (including withdrawals); (2) severe restrictions (for leasable minerals, the equivalent is a prohibition of surface occupancy); and (3) moderate restrictions (for leasable minerals, other restrictions which exceed standard terms and conditions. Closures are further divided into discretionary (under the control of BLM) and nondiscretionary (imposed by legislation or under the jurisdiction of another agency).

Severe restrictions can be imposed for locatable mineral development in ACECs, RNAs, and corridors of designated wild and scenic rivers. No surface occupancy on mineral leases is also considered a severe restriction. Seasonal operating and visual resource management constraints are considered moderate restrictions. Seasonal operating restrictions which may be utilized to protect wildlife during spawning or mating periods, or possibly limit salable mineral entries near a rural interface area, are considered moderate restrictions. Visual resource management restrictions can be imposed on mineral leasing and salable mineral entries. Visual resource management constraints may also apply to locatable mineral entries along a river designated as wild or scenic, and in some cases these constraints may be severe.

Existing community pit designations will continue under all alternatives. The establishment of community pits for salable mineral use by the BLM creates a superior right to remove mineral materials from the sites against subsequent mining claims. Existing power site withdrawals, which can severely restrict locatable mineral operations, would also remain in effect.

Tables 4-32 through 4-35 show by alternative, the acres of land available for, as well as restricted to, mineral development. Alternatives NA, A, and B make more acres of land available to mineral development. Likewise, alternatives C, D, E, and PA illustrate the restrictive effects of closures and restrictions on the availability of lands to mineral entry. Under all alternatives over 99 percent of the mineral estate would be available for mineral development.

There is no significant difference between the alternatives in opportunities for leasable or locatable mineral development or salable mineral disposals including the no action alternative. Therefore there would be no expected reduction in these type of mineral developments under any alternative compared to current restrictions. The irreversible and irretrievable commitment of resources will be the amounts of mineral commodities actually removed from the public lands.

Forest Commodities

Table 4-32 Locatable Mineral Availability by Alternative (Acres)

	Mineral	Alternative						
Restrictions	Potential	NA	A	B	C	D	E	PA
Closed: Non-Discretionary	High	0	0	0	0	0	0	0
	Moderate	82	82	82	82	82	82	82
	Low	212	212	212	212	212	212	212
Closed: Discretionary	High	375	0	213	371	533	533	533
	Moderate	425	171	521	1,083	1,098	1,098	1,098
	Low	2,116	1,948	2,671	3,125	3,125	4,497	3,125
Open: Standard Requirements	High	22,699	23,044	22,831	22,673	21,118	22,511	21,118
	Moderate	84,157	84,411	84,061	83,499	79,447	83,484	79,447
	Low	288,493	288,771	287,828	287,374	265,682	285,275	265,682
Open: Additional Restrictions	High	1,346	1,376	1,376	1,376	2,769	1,376	2,769
	Moderate	3,314	3,314	3,314	3,314	7,351	3,314	7,351
	Low	16,154	16,044	16,264	16,264	37,956	16,991	37,956

Table 4-33 Oil and Gas Availability by Alternative (Acres)

	Mineral	Alternative						
Restrictions(X)	Potential	NA	A	B	C	D	E	PA
Closed: Non-Discretionaary	High	28	28	28	28	28	28	28
	Moderate	0	0	0	0	0	0	0
	Low	0	0	0	0	0	0	0
Closed: Discretionary	High	0	0	0	0	0	0	0
	Moderate	0	0	0	0	0	0	0
	Low	0	0	0	0	0	0	0
Open: No Surface Occupancy	High	4,048	1,405	4,821	5,254	5,805	5,805	4,847
	Moderate	589	462	589	589	765	765	765
	Low	3,451	3,842	3,375	4,071	4,071	4,071	4,071
Open: Standard Stipulations	High	141,657	144,290	132,200	126,988	34,686	76,722	131,283
	Moderate	74,278	74,405	73,267	73,197	42,740	54,194	73,526
	Low	173,011	160,254	161,906	151,010	82,349	121,819	151,520
Open: Additional Restrictions	High	10,106	10,106	18,780	23,559	114,310	73,274	19,671
	Moderate	1,790	1,790	2,801	2,871	33,152	21,698	2,366
	Low	10,425	22,791	21,606	31,806	100,467	60,997	31,296

X Total Acreage includes 1,717 acres of split estate.
Not all additional restrictions are additive because of overlaps.

Table 4-34 Geothermal Availability by Alternative (Acres)

		Alternative						
Restrictions(X)	**Mineral Potential**	**NA**	**A**	**B**	**C**	**D**	**E**	**PA**
Closed:	High	0	0	0	0	0	0	0
Non-	Moderate	0	0	0	0	0	0	0
Discretionary	Low	28	28	28	28	28	28	28
Closed:	High	0	0	0	0	0	0	0
Discretionary	Moderate	0	0	0	0	0	0	0
	Low	0	0	0	0	0	0	0
Open: No	High	0	0	0	0	0	0	0
Surface	Moderate	0	0	0	0	0	0	0
Occupancy	Low	8,371	6,128	9,204	10,333	11,060	11,060	10,063
Open: Standard	High	0	0	0	0	0	0	0
Requirements	Moderate	0	0	0	0	0	0	0
	Low	390,399	391,338	382,794	372,622	307,547	297,450	372,307
Open:	High	0	0	0	0	0	0	0
Additional	Moderate	0	0	0	0	0	0	0
Restrictions	Low	22,291	23,595	29,063	38,106	102,454	112,551	38,691

X Total acreage includes 1,717 acres of split estate.

Table 4-35 Salable Mineral Availability by Alternative (Acres)

		Alternative						
Restrictions(X)	**Mineral Potential**	**NA**	**A**	**B**	**C**	**D**	**E**	**PA**
Closed:	High	0	0	0	0	0	0	0
Non-	Moderate	28	28	28	28	28	28	28
Discretionary	Low	0	0	0	0	0	0	0
Closed:	High	0	0	0	0	0	0	0
Discretionary*	Moderate	6,689	4,446	7,522	8,651	9,378	9,378	8,387
	Low	0	0	0	0	0	0	0
Open: Standard	High	1,890	1,890	1,890	1,890	1,890	1,890	1,890
Stipulations	Moderate	405,546	407,789	404,713	403,584	378,857	402,857	379,848
	Low	0	0	0	0	0	0	0
Open:	High	0	0	0	0	0	0	0
Additional	Moderate	5,218	5,218	5,218	5,218	29,218	5,218	29,218
Restrictions+	Low	0	0	0	0	0	0	0

X Total acreage includes 1,717 acres of split estate.
* Withdrawals, ACECs, cultural sites, areas suitable for designation as a recreational river.
+ Time restriction within 1/4 mile of any migratory bird site.

Effects on Socioeconomics Conditions

Personal Income, Employment and Population

Each alternative analyzed in this RMP/EIS proposes varying management prescriptions that would alter the production of commodity and amenity outputs from BLM-administered lands. The annual level of timber sold and expenditures associated with timber management activites has been estimated for each alternative. The demand for recreational opportunities (hunting, fishing, and other recreation) and BLM's capability to meet these demands has also been estimated. No estimates have been made of the economic contributions to local personal income and employment that could be made by any potential development in the area. Potential mineral, energy, communication, and hydro-electric developments have not been analyzed. The timing, duration, and degree of such development is speculative and cannot be estimated at reasonably accurate levels given current information.

The input-output model, BLMPACT, was specifically developed to assess annual levels of personal income and employment associated with specific levels of BLM resource outputs. Because this model has not been validated its predictive capability is uncertain. Changing national demand and production technology influence local and regional business cycles and levels of personal income and employment. The BLMPACT model holds national demand and technology constant resulting in estimated effects that represent only changing natural resource uses. The results, therefore, do not incorporate any effects or assumptions about future business cycles. The analysis period was limited to the expected life of the plan. Economic regions were assumed to follow county boundaries. Multiple counties were combined to formulate districts. Where district boundaries were substantially different from county boundaries exceptions were made. In the Roseburg District, the portion of Douglas County in the Coos Bay District was removed and included in the Coos Bay model. Using BLMPACT, models were developed for each western Oregon BLM district and for the western Oregon region. Table 4-36 summarizes the measurable outputs by alternative that were used to estimate the economic impacts within the Roseburg District.

For each alternative, the measurable annual outputs were entered into the BLMPACT input-output model for analysis. Individual analyses for each alternative and resource were conducted. Direct and total personal income (1989 dollars) and employment dependent on BLM resource use in the Roseburg District are displayed in Table 4-37. The lumber and wood products sector represents approximately 70 percent of the total dependent personal income and approximately 60 percent of total dependent employment. Detailed tables are on file in the district office.

Declines in personal income and employment compared to the no action alternative would be greatest under alternative E and least under the preferred alternative. Alternatives A and B would increase personal income and employment. The no action alternative is itself a decline from average 1984-1988 levels of dependent personal income and employment. The level of resource outputs from BLM managed lands would have the greatest personal income and employment effects on resource dependent industries in the district. These include logging camps, transportation, sawmills, and veneer and plywood mills. Respending by businesses and individuals extends the economic impacts to all sectors of the economy and throughout western Oregon. Businesses such as real estate, wholesale and retail trade, eating and drinking establishments, finance, insurance, and services would also be affected by the alternatives. As mentioned in Chapter 3, employment in the lumber and wood products sector has declined with the closure of several mills in the Roseburg district since 1988. Additional permanent job and income losses in the wood products industry in the Roseburg District would be an unavoidable adverse impact of the preferred alternative. Population migration is closely linked to the availability, or perceived availability, of employment. Out-migration of working age residents and their families could be expected under Alternatives C, D, E, and PA.

The management of BLM's timber resource is only one component of a larger economy. A cumulative analysis was conducted to display a more complete picture of timber dependent personal income and employment. The cumulative analysis differs from the marginal analysis of BLM alternatives for each district in that it attempts to estimate the income and employment effect of all timber harvest in western Oregon. The common and preferred alternatives from all western Oregon Districts were used to represent region-wide BLM harvests. Alternative B in the USFS's recent FEIS on Management for the Northern Spotted Owl in the National Forests (January 1992) was used to represent USFS harvest levels. Harvests from State, industrial and non-industrial private lands were estimated using the PNW Research Station's Timber Supply Analysis for BLM Planning.

Table 4-36. Summary of Measureable Annual Outputs by Alternative in the Roseburg District.

	BASE	NA	A	B	C	D	E	PA
TIMBER HARVEST (MMCF)	41.07	39.47	47.87	44.02	11.22	14.33	3.15	16.30
NON-RESIDENT RECREATIONAL USE 1/								
FISHING (ANGLER DAYS)	4,700	5,940	5,940	5,940	5,940	5,940	5,940	5,940
HUNTING (HUNTER DAYS)	4,200	4,930	4,930	4,930	4,930	4,930	4,930	4,930
NON-CONSUMPTIVE (USER DAYS)	33,100	43,590	3,874	41,150	46,580	46,580	48,580	46,580
FISHERIES PRODUCTION 2/								
COMMERCIAL (M LBS LANDED)	98.805	98.605	98.805	98.805	98.805	98.805	98.805	98.805
INLAND SPORT (DAYS)	12,400	12,400	12,400	12,400	12,400	12,400	12,400	12,400
OCEAN SPORT (DAYS)	6,600	8,800	6,800	6,800	6,600	6,600	6,800	6,800
TIMBER MANAGEMENT ACTIVITY ($MM)	N/A	4.493	4.925	4.550	3.478	1.632	0.564	2.400

1/ Hospodarsky, 1989. Pacific Northwest Outdoor Recreation Consumption Projection Study: Oregon Project Final Report.
Eixenberger, Don. Oregon State Parks. Personal Communications. July 23, 1991, November 20, 1991 and December 10, 1991.

2/ Carter, C. Oregon Dept. of Fish and Wildlife. Personal Communication. December 18, 1991.

Table 4-37. Estimated Dependent Personal Income and Employment by Alternative in the Roseburg District.

	BASE	NA	A	B	C	D	E	PA
PERSONAL INCOME, MILLIONS (1989 DOLLARS)								
TIMBER HARVEST								
DIRECT	37.932	31.513	38.060	35.146	6.958	11.441	2.515	13.014
TOTAL	51.536	44.073	53.075	49.067	12.596	16.082	3.538	16.276
NON-RESIDENT RECREATION								
DIRECT	0.276	0.358	0.326	0.343	0.377	0.390	0.390	0.390
TOTAL	0.448	0.576	0.526	0.553	0.606	0.629	0.629	0.629
FISHERIES PRODUCTION								
DIRECT	0.171	0.171	0.171	0.171	0.171	0.171	0.171	0.171
TOTAL	0.370	0.370	0.370	0.370	0.370	0.370	0.370	0.370
TIMBER MANAGEMENT ACTIVITY								
DIRECT	N/A	1.420	1.550	1.440	1.100	0.520	0.180	0.760
TOTAL	N/A	2.700	2.960	2.730	2.090	0.970	0.350	1.430
	BASE	NA	A	B	C	D	E	PA
EMPLOYMENT (JOBS)								
TIMBER HARVEST								
DIRECT	1,560	1,300	1,570	1,450	370	470	100	540
TOTAL	2,480	2,110	2,540	2,350	800	770	170	860
NON-RESIDENT RECREATION								
DIRECT	30	30	30	30	40	40	40	40
TOTAL	40	50	50	50	50	50	50	50
FISHERIES PRODUCTION								
DIRECT	20	20	20	20	20	20	20	20
TOTAL	30	30	30	30	30	30	30	30
TIMBER MANAGEMENT ACTIVITY								
DIRECT	N/A	170	190	170	130	60	20	90
TOTAL	N/A	250	270	250	190	90	30	130

SOURCE: USDI, BLM, Oregon State Office, May 1988. BLMPACT Software and Reference Manual. OR-953-CT9-2019. Prepared by ECO Northwest.

Direct and total personal income and employment were estimated using coefficients developed for western Oregon by the USFS. The coefficients were developed using the same data and techniques used by the USFS for the FEIS on Management for the Northern Spotted Owl in the National Forests (January 1992). See Table 4-38 for a summary of estimated direct and total personal income and employment. These coefficients differed from district analyses by including income and employment resulting from additional processing of chips, peeler cores, and other by-products from plywood and sawmills; federal employment directly tied to the timer program; and pulp and paper employment.

Payments Made to State and County Governments

Future prices for timber stumpage in the northwest are a key determinant of future revenue impacts. O & C revenues, severance taxes, U.S. Treasury receipts, and competitiveness of the region's lumber and wood products industry are dependent on the stumpage price. Price is determined by the interaction of supply and demand in local, regional, national, and international markets. Changing supply by other ownerships, import and export restrictions in the U.S. and in other nations, as well as the availability of substitute materials will influence future prices. Price information was developed by the PNW Research Station through examination of demand and supply by all ownerships. A nominal 1993-2000 price was estimated for each alternative. These prices were used to estimate future O & C payments to the counties. Table 4-39 displays the projected payments by county attributable to harvest in the Roseburg District under each alternative. Assuming that all BLM districts would adopt similar alternatives, estimated total O & C payments to counties dependent on BLM harvest levels are displayed in Table 4-40. Rising prices, relative to the no action alternative, under alternatives C, D, E, and the Preferred would counteract reduced harvest quantities, moderating the estimated revenue losses. Price declines under alternatives A, and B would be small and revenues under these alternatives would increase above levels expected under the no action alternative. Foregone revenues to county discretionary funds under the preferred alternative is an unavoidable adverse impact that would reduce county programs unless replaced. Counties could obtain replacement revenues through a variety of taxation methods; this would increase the tax burden of county residents and property owners. Under the Preferred Alternative county revenues are expected to increase slightly from 1984-1988 baseline levels.

Coos Bay Wagon Road (CBWR) payments to local taxing districts would decline under Alternatives C, D, E, and PA. CBWR payments would increase under Alternatives A and B. Under the Preferred Alternative revenue reductions of 55 percent compared to the no action alternative from levels are expected. The Camas Valley School District which receives a substantial portion of its funding from this source would be particularly impacted.

Approximately 5 percent of the revenues generated by Public Domain lands are dispersed through the State to the counties based on total land area of the counties. The counties must use these revenues to build roads and bridges. Under alternatives A, and B these payments would increase compared to levels under the no action alternative. Revenues would be reduced under the remaining alternatives.

Payments in Lieu of Taxes made for a variety of federal lands within the counties would remain unchanged under all alternatives. Potential changes in land tenure through exchanges, by BLM and other federal agencies could alter the level of payments made to counties. Without specific proposals, the extent of this impact cannot be estimated.

Under alternatives NA, C, D, E, and the preferred alternative harvest volume subject to state harvest tax revenues would decline. Harvest volumes would increase under alternatives A, and B. Harvest volumes and the tax rate determine revenues. Given existing tax rates, harvest tax revenues can be expected to correlate highly with harvest volumes. Decreased revenues would negatively impact the State forestry programs funded by this tax. Increased tax rates or alternative revenue sources may be used by the State to fund programs, possibly redistributing the tax burden.

Community Stability

The estimates of employment and personal income discussed earlier are district-wide and region-wide aggregates. The distribution of these specific impacts would show great variation between communities in the district depending on their existing economic base and natural resource dependence. Alternatives C, D, E, and PA would result in reduced timber harvest in the district. Reduced harvest levels would adversely affect the local economy. All sectors of the economy would be impacted, however the lumber and wood products industry would be particularly affected. Mill closures, decreasing employment, and migration from timber dependent communities are all common results of reduced timber harvests. Reduced federal revenue sharing receipts would also occur under these alterna-

Table 4-38. Estimated Personal Income and Employment Dependent on Timber Harvest from all Sources, Western Oregon.

	BASE	NA	A	B	C	D	E	PA
VOLUME, ALL SOURCES (MMCF)	1,243	1,114	1,165	1,143	1,009	1,014	998	1,034
PERSONAL INCOME ($MM)								
DIRECT	2,774.003	2,486.114	2,599.931	2,550.833	2,251.785	2,262.944	2,227.237	2,307.578
TOTAL	5,386.043	4,827.073	5,048.062	4,952.733	4,372.979	4,393.763	4,324.434	4,380.425
EMPLOYMENT (JOBS)								
DIRECT	59,100	53,000	55,400	54,300	48,000	48,200	47,500	49,200
TOTAL	113,000	101,300	105,900	103,900	91,700	92,200	90,700	94,000

SOURCES:

USDA, USFS, PNW Research Station. May 1992. Timber Supply Analysis for BLM Planning.

Alward, Greg. Personal Communication. May 1992. USDA, USFS, Fort Collins, CO.

Table 4-39. Projected O & C Payments to Counties Attributable to Timber Harvest in the Roseburg District (Current Dollars).

	1984–1988 AVERAGE	NA	A	B	C	D	E	PA
Benton	376,958	716,346	816,278	770,922	225,045	285,564	63,795	323,452
Clackamas	744,525	1,414,846	1,612,222	1,522,639	444,484	564,014	126,000	638,846
Columbia	276,346	525,150	598,410	565,160	164,980	209,346	46,768	237,121
Coos	791,477	1,504,071	1,713,894	1,618,661	472,515	599,582	133,946	679,133
Curry	489,642	930,484	1,060,290	1,001,375	292,318	370,928	82,865	420,142
Douglas	3,360,422	6,385,928	7,276,787	6,872,452	2,006,185	2,545,683	568,702	2,883,438
Jackson	2,102,108	3,994,710	4,551,986	4,299,055	1,254,967	1,592,449	355,751	1,803,731
Josephine	1,620,515	3,079,521	3,509,125	3,314,140	967,454	1,227,619	274,248	1,390,496
Klamath	313,908	596,530	679,748	641,978	187,404	237,800	53,124	269,351
Lane	2,048,449	3,892,739	4,435,790	4,189,315	1,222,932	1,551,799	346,670	1,757,688
Lincoln	48,293	91,774	104,577	98,766	28,831	36,585	8,173	41,439
Linn	354,152	673,008	766,895	724,282	211,430	268,288	59,935	303,883
Marion	195,857	372,194	424,116	400,550	116,927	148,371	33,146	168,057
Multnomah	146,222	277,871	316,635	299,041	87,295	110,770	24,746	125,467
Polk	289,761	550,643	627,459	592,595	172,988	219,508	49,038	248,632
Tillamook	75,123	142,759	162,675	153,636	44,849	56,909	12,714	64,460
Washington	84,514	160,604	183,009	172,840	50,455	64,023	14,303	72,518
Yamhill	96,587	183,548	209,153	197,532	57,663	73,169	16,346	82,877
Total	13,414,858	25,492,726	29,049,049	27,434,937	8,008,724	10,162,406	2,270,268	11,510,730
Assumed Price 1/	707	1,398	1,319	1,349	1,545	1,535	1,560	1,510
Total Volume (MCF) 2/	41,070	39,470	47,670	44,020	11,220	14,330	3,150	16,500
O&C Volume (MCF) 3/	37,949	36,470	44,047	40,674	10,367	13,241	2,911	15,246

1/ USDA, USFS, PNW Research Station, 1992. Timber Supply Analysis for BLM Planning. Portland, OR.
2/ USDI, BLM, Oregon State Office, Various Years. BLM Facts. Converted using 6.2 mbf/mcf.
3/ O & C Lands are 92.4 percent of BLM lands in the Planning Area.

Table 4-40. Projected O & C Payments to Counties Attributable to Timber Harvest in Western Oregon (Current Dollars).

	1984–1988 AVERAGE	NA	A	B	C	D	E	PA
Benton	1,708,328	3,181,399	3,994,414	3,687,773	1,250,967	1,405,277	1,036,152	1,738,483
Clackamas	3,374,099	6,283,545	7,889,322	7,283,679	2,470,771	2,775,546	2,046,491	3,433,658
Columbia	1,252,368	2,332,271	2,928,289	2,703,492	917,079	1,030,203	759,599	1,274,475
Coos	3,586,880	6,679,805	8,386,847	7,743,010	2,626,586	2,950,581	2,175,549	3,650,195
Curry	2,219,002	4,132,422	5,188,473	4,790,167	1,624,922	1,825,359	1,345,891	2,258,172
Douglas	15,229,041	28,360,866	35,608,562	32,874,985	11,151,860	12,527,465	9,236,867	15,497,864
Jackson	9,526,510	17,741,109	22,274,897	20,564,911	6,976,034	7,836,542	5,778,112	9,694,672
Josephine	7,343,985	13,676,617	17,171,714	15,853,486	5,377,823	6,041,189	4,454,345	7,473,621
Klamath	1,422,593	2,649,279	3,326,309	3,070,957	1,041,731	1,170,230	862,845	1,447,705
Lane	9,283,332	17,288,240	21,706,297	20,039,961	6,797,960	7,636,503	5,630,617	9,447,201
Lincoln	218,860	407,581	511,740	472,455	160,266	180,035	132,745	222,724
Linn	1,604,977	2,988,930	3,752,759	3,464,669	1,175,286	1,320,260	973,466	1,633,308
Marion	887,601	1,652,969	2,075,389	1,916,067	649,969	730,144	538,356	903,269
Multnomah	662,661	1,234,066	1,549,434	1,430,488	485,251	545,107	401,924	674,358
Polk	1,313,163	2,445,488	3,070,439	2,834,729	961,597	1,080,213	796,472	1,336,343
Tillamook	340,450	634,015	796,040	734,930	249,303	280,055	206,493	346,459
Washington	383,006	713,267	895,545	826,796	280,466	315,062	232,304	389,767
Yamhill	437,721	815,163	1,023,480	944,910	320,532	360,071	265,491	445,448
Total	60,794,577	113,217,030	142,149,949	131,237,465	44,518,403	50,009,842	36,873,720	61,867,720
Assumed Price 1/	707	1,398	1,319	1,349	1,545	1,532	1,560	1,510
Total Volume (MCF)2/	202,020	190,310	251,390	226,600	67,980	79,070	55,860	96,510
O&C Volume (MCF) 3/	171,979	161,970	215,542	194,570	57,629	65,287	47,274	81,944

1/ USDA, USFS, PNW Research Station, 1992. Timber Supply Analysis for BLM Planning. Portland, OR.
2/ USDI, BLM, Oregon State Office, Various Years. BLM Facts. Converted using 6.2 mbf/mcf.
3/ Projected O&C Payments to Counties. All Districts.

Table 4-41. Projected State Retaining Costs for Displaced Lumber and Wood Products Workers (Current Dollars).

ALTERNATIVE 1/	ROSEBURG DISTRICT		WESTERN OREGON	
	CURRENT PROGRAMS	ENHANCED PROGRAMS 2/	CURRENT PROGRAMS	ENHANCED PROGRAMS
C	4,271,000	11,426,000	17,612,000	45,405,000
D	3,832,000	9,958,000	16,386,000	42,238,000
E	5,557,000	14,629,000	19,357,000	50,321,000
PREFERRED	3,524,000	8,919,000	13,323,000	34,234,000

1/ No additional State retraining costs are anticipated under alternatives A, B, or No Action.

2/ Enhanced programs include higher funding for existing programs plus child care, health insurance, social service, and relocation cost programs.

tives. Timber dependent communities such as Sutherlin, Riddle, Camas Valley, and Days Creek could be severely impacted. (Source: OEDD, Status Report, November, 1991) Effects on individual mills and communities cannot be reliably predicted and are therefore not shown here.

It is very likely that employment losses under alternatives C, D, E, and PA would increase local demand for social services. State and county provided services such as unemployment insurance, health care and job placement will be in greater demand. The BLM has provided to the State of Oregon projected changes in employment levels for each alternative. Using estimated numbers of displaced lumber and wood products workers, additional retraining and support costs under each alternative were calculated by the State of Oregon. Estimated costs under the current programs and at an enhanced level of assistance were calculated. The results are displayed in Table 4-41. Under current training and support programs an estimated 42 percent of displaced workers would receive assistance. With an enhanced program approximately 60 percent would be assisted. The State is anticipating harvest reductions by BLM and USFS under the Endangered Species Act and other environmental constraints and is taking an active role in assisting displaced timber workers and timber dependent communities through a Coordinated Timber Response Plan. Demand for county services is also expected to increase under these same alternatives, yet county O & C revenues are expected to decline. These reductions will reduce the county's ability to respond to increased social service needs. Federal legislation in FY 1991 and FY 1992 has protected counties from large reductions in O & C revenues. The FY 1992 legislation guarantees 90 percent of average receipts in the previous five years up to 100 percent of total receipts. Continuation of this legislation in the future would mitigate projected county revenue impacts under alternatives C, D, E, and PA.

Recreation demand is expected to grow throughout the life of the plan. None of the alternatives would meet the anticipated increases in demand for all activities. Demands for non-motorized travel, camping, and other land based recreation would not be met under alternatives NA, B, C. Existing demand for these activities would not be met under alterantive A. Alternatives D, E, and PA would not meet anticipated increases in off-road vehicle use. Hunting and increased fishing demand would be met under all alternatives. In communities able to attract and capture increased recreational use, recreation associated spending could increase local personal income and employment. Specific communities and to what extent is unknown. Development of tourism activities and related businesses in timber dependent communities is not anticipated to fully replace employment and personal income losses in the wood processing industry under alternatives C, D, E, and PA.

Although employers are often attracted to areas where labor is readily available (communities with unemployment) other factors can discourage new businesses from locating in certain communities. Prolonged economic difficulties such as reduced revenue sharing, out-migration, business closures, and reduced tax bases can decrease the quality of schools, roads, community services, and police and fire protection. Without quality basic services new businesses will be discouraged from locating in these communities.

Impacted communities would suffer not only permanent loss of jobs and income associated with timber harvest and processing but also reduced prospects for community redevelopment with alternative businesses. Incentives or economic assistance could be provided by federal, state, or local governments to partially mitigate these impacts.

Non-market Values

The analysis of socioeconomic impacts of alternative BLM resource management thus far has focused on timber management and quantifying the impacts to personal income, employment, population, and federal revenue sharing. Additional impacts can be expected reflecting societal and individual values. The extent of these impacts is difficult to assess because markets rarely exist or fully capture the satisfaction or dissatisfaction society and individuals derive from the natural environment. Alternatives C, D, E, and the Preferred would maintain or enhance wild fish populations, endangered species and their habitats, varying levels of biodiversity, visual resources, and other natural values. These alternatives would increase the satisfaction of individuals who value the protection of these natural resources now and for future generations. Those individuals directly impacted by changes in BLM management and others many not hold these levels of natural resource protection/preservation as valuable as the jobs, income, and revenue lost under these alternatives. It is likely these people would experience dissatisfaction under alternatives C, D, E, and PA.

Effects on Rural Interface Areas

Resource management activities, such as road construction and timber harvest, can create adverse impacts on neighbors living in rural interface areas (RIA) (see Chapter 3, Rural Interface Areas, for a list of known impacts related to BLM management in the Roseburg District). In turn, the reactions of neighbors to these activities can create opportunity costs (e.g., decisions to defer or not harvest timber) or additional costs for BLM to manage resources in RIAs. In some situations, the number of neighbors and the number of resource management activities are directly proportional to the number of concerns expressed by neighbors, conflicts, and additional costs to BLM. The water quality of domestic water sources would be maintained under all alternatives.

The no action alternative provides a moderate level of timber harvest. No special or alternative timber management practices are identified under this alternative. Impacts and conflicts in the the RIAs would be expected to be similar to those described under alternative A.

Alternative A provides the highest level of timber harvest and road construction in RIAs. No special timber management actions or mitigation measures would be required under this alternative. Potential mineral development would be minimally constrained. Short term adverse impacts associated with timber management and mineral development include smoke, dust, noise, and increased truck traffic. These impacts would be intermittent and of short duration. Visual impacts of timber management in the rural interface would vary in magnitude and duration. The visual impact of harvesting timber would lessen as the harvested area was revegetated.

The visual impact of forest road construction could be a long term impact depending on the visibility of the road and the ability of subsequent revegetation to screen the road. The visual impact of mineral development could be long term depending on the visibility of the operation in the interface, the type of operation, the ability to effectively perform reclamation, and the ability of subsequent revegetation to screen the operation.

Alternative B provides for a high level of timber harvest. In RIAs special timber harvest mitigation measures may be used on 8,552 acres of public lands within 1/4 mile of areas zoned by Douglas County for residential use of one to five acre lots.

Examples of mitigating measures applicable to alternatives B and C include harvest regimes other than clearcutting, hand application rather than aerial application of herbicides and pesticides, inclusion of additional buffers for domestic water sources, and hand piling of slash for burning as opposed to broadcast burning. The land would be managed for VRM class III objectives and no surface occupancy for oil and gas development would be allowed. Short term and cumulative impacts of alternative B would be less than alternative A because forest management practices would be altered within 1/4 mile of the RIAs, where practical to mitigate adjacent neighbors concerns.

Alternative C provides a moderate level of timber harvest. In RIAs special timber harvest mitigation measures would be used on 8,552 acres within 1/4 mile of areas zoned by Douglas County for residential use of one to five acre lots.

Conflicts and impacts under alternative C would be expected to be less than alternatives A and B because of the harvest and silvicultural practices used. The practices used under alternative C which are less intensive than alternatives A and B include green tree retention or shelterwood harvesting, less broadcast burning, less reliance on herbicides and pesticides, and more areas of permanently reserved old-growth stands.

Alternative D provides a moderate level of timber harvest. In RIAs, special timber harvest constraints would be used on 8,552 acres within 1/4 mile of areas zoned by Douglas County for residential use of one to five acre lots. The following alternative timber management practices would not be applied on those lands: herbicide spraying, clear-cutting and prescribed burning. Future oil and gas development would be allowed within 1/4 mile of these areas, but with no surface occupancy. These lands would be managed according to VRM class II objectives. Short term and cumulative impacts would be less under this alternative than under alternatives A, B and C because implementing the above practices would reduce conflicts and impacts in the RIA.

Under alternative E, potential conflicts in RIAs within 1/2 mile of areas zoned by Douglas County for residential use of one to five acre lots would be low due to constraints on timber harvesting. The following alternative timber management practices would not be applied on the 24,139 acres which comprise those lands: herbicide spraying, clear-cutting, and prescribed burning. Future oil and gas development would be allowed within 1/4 mile of these areas, but with no surface occupancy. These lands would be managed according to VRM class II objectives. Alternative E would cause the least short term and cumulative impacts compared to other alternatives because of practices used and the widely dispersed and infrequent management practices associated with low commodity and high ammenity management.

The following alternative timber management practices would not be applied on those lands: aerial application of herbicide, clear-cutting and broadcast burning. Future oil and gas development would be allowed within 1/4 mile of these areas, but with no surface occupancy. These lands would be managed according to VRM class II objectives. Short term and cumulative impacts would be less under this alternative than under alternatives A, B, and C because implementing the above practices would reduce conflicts and impacts in the RIA. Impacts and conflicts under the preferred alternative would be expected to be similar to those under alternative D and somewhat more than under alternative E.

In addition to management practices described above, impacts and conflicts in the RIA would vary under the preferred alternative depending on the overall management of the lands where the RIA is located. RIAs would be managed to VRM III standards under the preferred alternative. In the GFMA, six to eight trees would be retained on all harvest units. This practice would further lessen visual impacts in addition to those practices described above for the RIAs under the preferred alternative. In connectivity areas, rotation would be set at 150 years, 12 to 16 trees per acre would be retained on harvest units, and there would be less intensive forest management practices used (such as broadcast burning) compared to traditional forest management. These practices, in addition to specific management guidelines for RIAs described above would further lessen impacts. In OGEAs, regeneration harvest would be deferred for 80 years, the rotation would be set at 300 years, and high retention of old-growth would be practiced. Therefore, impacts and conflicts to RIAs located in OGEAs would be minimal.

The preferred alternative provides a moderate level of timber harvest. In RIAs special timber harvest mitigation measures would be used on 8,552 acres within 1/4 mile of areas zoned by Douglas County for residential use of one to five acre lots.

Consistenty with Other Agency Plans and Programs

Cooperative interrelationships between BLM and other agencies are discussed in Chapter 5. BLM planning regulations require that RMPs be "consistent with officially approved or adopted resource-related plans, and the policies and procedures contained therein, of

Tree Planting

other federal agencies, state and local governments, and Indian tribes, so long as the guidance and RMPs are also consistent with the purposes, policies and programs of federal laws and regulations applicable to public lands..." (43 CFR 1610.3-2). Consistency is construed as the absence of conflict. Based on BLM's knowledge of the plans of such other agencies, the alternatives have been compared to the following agencies' plans, for consistency, and BLM has reached the conclusions stated.

Federal Agencies

All alternatives are believed to be consistent with the following plans of other federal agencies:

- The Forest Service's forest-wide land use plans for the adjacent Umpqua National Forest
- Soil Conservation Service watershed plans
- The Fish and Wildlife Service's Pacific Bald Eagle Recovery Plan (see Effects on Threatened and Endangered Species)
- The National Park Service's Nationwide Rivers Inventory (see Effects on Wild and Scenic Rivers)
- The Bonneville Power Administration's latest annual Transmission System Facilities Resource Program

State Government

All alternatives are believed to be consistent with the following plans, programs, and policies of State of Oregon agencies:

- Department of Environmental Quality (see Effects on Air Resources)
  - Smoke Management Plan
  - Visibility Protection Plan and air quality policies
  - Prevention of Significant Deterioration requirements
- Water Resources Department river basin programs for the Umpqua River
- Water Resources Commission rules and statutes
- Department of Human Resources, Health Division, standards for public water systems
- Department of Agriculture, weed control plans
- Forestry Department, Forest Practices Act requirements
- Department of Agriculture, weed control plans (if any are relevant)
- Division of State Lands, Removal-Fill Law
- Parks and Recreation Department
  - Statewide Comprehensive Outdoor Recreation Plan (see Effects on Recreation)
    - State Parks and Recreation System Plan
    - State Recreation Trails Plan (see Effects on Recreation)
    - State Historic Preservation Program
    - Oregon Beach Law
- Department of Transportation, Highway Division
  - Oregon Highway Plan
  - Six Year Highway Improvement Plan
- Economic Development Department, Regional Economic Development Strategies

Consistency of the alternatives with some other State plans and programs is more complex, as described in the following discussions.

Consistency with the Department of Environmental Quality's Statewide Water Quality Management Plan (including Water Quality Standards and Guidelines) and the state's antidegradation policy would vary by watershed analyzed. In alternatives NA, A, B, C, D, and PA, the cumulative effects of timber harvest activities on BLM-administered lands plus other ownerships could lead to violation of the state's antidegradation policy in one or more of the watersheds analyzed unless either private activities are less than anticipated (by BLM) or BLM can lessen the cumulative impacts by scheduling its timber sales to occur at different periods than most of the anticipated private timber harvest.

Alternatives NA, A, and B fall short of full consistency with Oregon's Statutory Wildlife Policy and the Oregon Threatened and Endangered Species Act. Consistency with the Department of Fish and Wildlife's many plans, policies, rules and objectives is addressed in Appendix 4-21.

Consistency with the Board of Forestry's Forestry Program for Oregon (FPFO) is complex, due to the diversity of goals of the FPFO. Alternatives C, D, E, and PA would reduce the current commercial forest land, while alternatives NA, A, and B would be inconsistent with some recent revisions of Oregon Forest

Practices Act rules. Although the preferred alternative could be inconsistent with some FPA rules, the PA would be consistent with the objectives of the FPA. More specificity regarding consistency with the five FPFO objectives is provided in Appendix 4-22.

Alternatives NA, A, B, and C would not provide specific protection, on all BLM-administered lands, for state-listed endangered plant species identified by the Oregon Dept. of Agriculture, unless the species are also federally listed. At this time there are no state-listed plant species in this circumstance known to exist on BLM-administered lands in the planning area. If any such species are subsequently listed by the department, these alternatives could be inconsistent with the department's plans for those species. See Effects on Special Status Species for further discussion.

Alternatives NA, A,B, C, and PA would designate only some of the potential research natural areas identified in the Natural Heritage Program administered by the Division of State Lands, and would thus be inconsistent with that program. The other alternatives would be fully consistent with it. See Effects on Special Areas for further discussion.

Consistency with the statewide planning goals and guidelines administered by the Land Conservation and Development Commission (LCDC) through the Department of Land Conservation and Development is variable among the 12 goals for which Roseburg District BLM plan consistency is relevant. Oregon's land use program was enacted 19 years ago. Today a complex body of land use policy and goal interpretations exists due to the acknowledgment process, goal amendments, LCDC rule making, and Land Use Board of Appeals and appellate court decisions. The matter of BLM consistency with the statewide goals involves a number of interrelated issues of policy, intergovernmental coordination and state and federal legal requirements. Consistency withe these goals is characterized generally in Appendix 4-23. The table also addresses consistency of BLM's plan alternatives with the goals established for the Oregon Coastal Management Program (OCMP).

The statewide planning goals are legally binding on all planning activity relating to land use undertaken by cities, counties, special districts, and state agencies. The planning goals function similarly for affected federal agencies making consistency determinations under the OCMP in accordance with the (Federal) Coastal Zone Management Act (CZMA). All applicable local government plans have been acknowledged by LCDC to be in conformance with the CZMA and all state agency programs and activities have been certified by LCDC to be in conformance with the CZMA. Local governments will, over the next few years, be revising their plans to comply with recent administrative rule revisions related to Goals 4 and 12, in the former instance increasing protection of forest lands and resources from conflicting uses and inappropriate rural development.

A section of the CZMA requires that "Each federal agency conducting or supporting activities directly affecting the coastal zone shall conduct or support those activities in a manner which is, to the maximum extent practicable, consistent with approved state management programs" [Subsection 308(c)(1)]. The term "to the maximum extent practicable" means that a federal agency's activities must be consistent with mandatory, enforceable, federally-approved state coastal zone policies whenever the agency has discretion under federal law to abide by state policies. The CZMA does not, however, impose a higher duty on federal agencies than a state requires of its own agencies. The OCMP mandatory enforceable policies consist of the statewide planning goals, acknowledged city and county comprehensive plans and land use regulations and the statutory authorities and regulations of state agencies listed in the OCMP. Although federal lands are excluded from the boundaries of the coastal zone, the "directly affecting" provision requires federal agencies to examine their activities for offsite effects. An effect may be either a primary, secondary, or cumulative effect on the coastal zone.

Local Government

The Oregon statewide planning program attaches substantial importance to the coordination of federal plans with acknowledged local comprehensive plans. To the extent that BLM actions and programs are consistent with acknowledged county and city comprehensive plans and land use regulations, they can also be considered consistent with statewide planning goals. Local plans do not, however, address protection of Goal 5 values from the effects of forest management, as state law prohibits local governments from regulating forest practices. The comprehensive plan for Douglas County could be affected by Roseburg District BLM's plan.

The district has contributed data for development of county comprehensive plans, followed the development of those plans through the years and consulted on issues of mutual interest. Based on knowledge gained through this involvement, the district planning staff believes that all alternatives are consistent with the comprehensive plans and land use regulations cited above.

Banding a Northern Spotted Owl

Chapter 5
Consultation and Coordination

Introduction

The Roseburg District Draft RMP/EIS was prepared by an interdisciplinary team of specialists from the Roseburg District Office with assistance from the Oregon State Office. Writing of the Draft began in early 1990; however, an elaborate process that began in 1986 preceded the writing phase. The planning process involved many steps with public participation, as well as consultation and coordination with many agencies and organizations throughout the process. Following is a list of people involved in the preparation of this Draft RMP/EIS, a list of agencies and organizations contacted during its preparation and to whom a copy of the Draft RMP/EIS has been sent and a summary of public involvement to date.

List of Preparers

Management Team

James A. Moorhouse
District Manager

Responsibilities: Management Direction.

Education/Experience: B.S., Forest Management; M.F., Resource Economics/Administration, University of Montana; USFS/BLM, 31 years.

Gordon Cheniae
Associate District Manager

Responsibilities: Management Direction.

Education/Experience: B.S., Park Administration and Recreation, Western Illinois University; M.S., Forestry-Outdoor Recreation Resource Management, Southern Illinois University; BLM, 17 years.

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Area Manager, North Umpqua Resource Area

RMP Team Member, Document Review, Management Direction.

Education/Experience: B.S., Forestry, University of Montana; Graduate Studies, Outdoor Recreation Management, University of Wyoming; BLM, 20 years.

John L. Hayes
Area Manager, Drain Resource Area

Responsibilities: RMP Team Member, Document Review, Management Direction.

Education/Experience: B.F., Forestry Management, Stephen F. Austin State University; BLM, 26 years.

Bennie C. Hobbs
Assistant District Manager, Division of Operations

Responsibilities: RMP Team Member, Document Review.

Education/Experience: B.S., Forestry Management, University of Idaho; BLM, 23 years.

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Area Manager, Dillard Resource Area

Responsibilities: RMP Team Member, Document Review, Management Direction.

Education/Experience: B.S., Forestry/Recreation Resource Management, University of Minnesota; Minnesota DNR, 1 year; BLM, 17 years.

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Responsibilities: RMP Team Member, Document Review.

Education/Experience: B.S., Forest Resource Management, University of Illinois; M.F., Forest Administration, Oregon State University; BLM, 16 years.

Al Wood
Area Manager, South Umpqua Resource Area

Responsibilities: RMP Team Member, Document Review, Management Direction.

Education/Experience: B.S., Forestry, University of Minnesota; USFS, 1 year; BLM, 18 years.

RMP Team

Isaac Barner
District Archaeologist

Responsibilities: Cultural and Paleontological Resources.

Education/Experience: B.A., Anthropology, Portland State University; BLM, 13 years.

Dave Erickson
Outdoor Recreation Planner, North Umpqua Resource Area

Responsibilities: Recreation, Visual Resources, Wild and Scenic Rivers.

Education/Experience: B.S., Biology, Albion College; M.S., Radiation Biology, University of Pittsburgh; M.S., Forestry, Colorado State University; BLM, 21 years.

David A. Faurot
District Fisheries Biologist

Responsibilities: Riparian and Fisheries.

Education/Experience: B.S., Engineering, U.S. Coast Guard Academy; M.S., Aquatic Ecology, University of Michigan; USFSW, 7 years; National Marine Fisheries Service, 7 years; Alaska Department of Fish and Game, 2 years; BLM, 2 years.

Monte Fender
Access Specialist

Responsibilities: Access.

Education/Experience: B.S., Forest Resource Management, University of Idaho; BLM, 26 years.

Joseph N. Graham
District Inventory Specialist

Responsibilities: Timber Resources (Technical), ASQ Determinations, Sensitivity Analyses, Inventory statistics and projections.

Education/Experience: B.S., Forestry, Purdue University; M.S., Forest Management, Oregon State University; USFS PNW Experiment Station, 3 years; Medford Corporation, 3 years; BLM, 7 years.

Philip J. Hall
Planning and Environmental Coordinator

Responsibilities: RMP Team Leader, Document Preparation, Public Involvement Technical Coorindator.

Education/Experience: B.S., Forestry, North Carolina State University; B.S., Conservation, North Carolina State University; BLM, 16 years.

Steve Hofford
District Hydrologist

Responsibilities: Water Resources.

Education/Experience: B.S., Watershed Science-Hydrology, Colorado State University; BLM, 3 months; Forest Service, 14 years; Geological Survey, l year.

Russ Holmes
District Botanist

Responsibilities: Vegetation, Special Status Species, Special Areas, Biodiversity.

Education/Experience: B.S., Biology, East Carolina University; M.S., Biology, East Carolina University; BLM, 2 years.

Dennis Hutchison
District Soil Scientist

Responsibilities: Soils.

Education/Experience: B.S., Resource Management-Specialization, Soil Science; Soil Conservation Service, 10 years; BLM, 14 years.

Craig Kintop
District Silviculturist

Responsibilities: Timber Resources, Managed Stand Yield Tables.

Education/Experience: B.S., Forest Resources Management, University of Minnesota; BLM, 16 years.

Fred Larew
District Realty Specialist

Responsibilities: Land Tenure, Rights-of-way, Land Classification and Withdrawal, Rural Interface.

Education/Experience: B.S., Geography, Weber State University; BLM, 15 years.

Doug McVean
District Wildlife Biologist

Responsibilities: Wildlife, Special Status Species.

Education/Experience: B.S., Game Management, Humboldt State University; BLM, 26 years.

Steven N. Niles
Timber Manager, South Umpqua Resource Area

Responsibilities: Timber Resources.

Education/Experience: B.S., Forest Management, University of Massachusetts; BLM, 14 years.

Curtis J. Ritter II
GIS/ARD Coordinator

Responsibilities: GIS Analyses.

Education/Experience: B.S. Forest Management, Northern Arizona University; Graduate Studies, Silvicultural Institute, University of Washington and University of Oregon; BLM, 23 years.

LaVon Ritter
Writer/Editor

Responsibilities: Document Preparation and Editing.

Education/Experience: B.S., Business Administration, B.S., Education, Southern Oregon State College; Private Industry, 15 years; BLM, 4 years.

Scott M. Siegfried
Hydrologist, South Umpqua Resource Area; Acting District Hydrologist July, 1991-April, 1992

Responsibilities: Water Resources.

Education/Experience: A.A.S., Fish and Wildlife Technology, Cobleskill (NY) College; B.S., Fisheries, Humboldt State University; M.A., Physical Geography, State University of New York at Buffalo; Forest Service, 2 years; BLM, 2 years.

Merrill Tester
District Fire Management Officer

Responsibilities: Fire.

Education/Experience: USFS, 12 years; BLM, 12 years.

Ted R. Weasma
District Geologist

Responsibilities: Energy and Minerals, Hazardous Waste.

Education/Experience: B.S., Geology, University of Washington; Registered Professional Geologist; BLM, 11 years.

State Office

Dale E. Bays
State Office Economist

Responsibilities: Timber Supply Analysis.

Education/Experience: B.S., Forestry, SUNY; Graduate Studies in Economics, SUNY and Utah State University, 5 years; BLM, 21 years.

Chris Cadwell
Natural Resource Database Specialist

Responsibilities: Inventory Analyses.

Education/Experience: B.S., Forest Management, Humbolt State University; BLM, 11 years.

Duane Dippon
GIS Specialist in Planning

Responsibilities: Automated Resource Data.

Education/Experience: B.S.F., Forest Management, Purdue University; M.S.F., Forest Management, Purdue University; Ph.D., Forest Economics, Oregon State University; Associate Professor, University of Florida, 8 years; BLM, 3 years.

Leslie Frewing-Runyon
Economist

Responsibilities: Socioeconomics.

Education/Experience: B.A., Economics, Willamette University; BLM, 3 years.

Rebecca Gravenmier
Natural Resource Specialist, GIS Use Analyst, GIS Section

Responsibilities: GIS Coordination and Development of GIS Computer Programs.

Education/Experience: B.S., Range Management, Utah State University; BLM, 6 years.

Phil Hamilton
Planning Process Coordinator

Responsibilities: State RMP Leader.

Education/Experience: B.S., Forestry, State University of New York; Graduate Studies in Public Administration and Economics; BLM, 35 years.

Jeffery S. Nighbert
State Office Senior Technical Specialist for Land Information Systems

Responsibilities: Biological Diversity Team Member, Hexagon Analysis, GIS Technical Advisor.

Eduction/Experience: B.U.S., Geography, University of New Mexico; M.A., Geography, University of New Mexico; BLM, 14 years; GIS Specialist, 12 years.

Other Agencies and Organizations Contacted

The RMP/EIS team or supporting individuals in the Oregon State Office contacted or received input from the following organizations during development of the Draft or the planning steps preceding its development. Copies of the Draft RMP/EIS have been sent to these organizations, agencies, or groups along with a large number of individuals and companies.

Federal Agencies

USDA, Forest Service
USDI, Bureau of Mines
USDI, Fish and Wildlife Service
USDI, Minerals Management Service
USDI, National Park Service
USDE, Bonneville Power Administration
US Environmental Protection Agency

State of Oregon Agencies

Office of the Governor
State Economist
Commission on Futures Research
Department of Agriculture
Department of Environmental Quality
Department of Fish and Wildlife
Department of Forestry
Department of Land Conservation and Development
Department of Transportation, Highway Division
Department of Transportation, Parks and Recreation Division
Department of Water Resources

Local Government and Other Government Bodies

Association of O&C Counties
Coos Curry Council of Governments
Benton County, Board of Commissioners
Curry County, Board of Commissioners
Douglas County, Board of Commissioners
Douglas County, Planning Department
Jackson County, Commissioner Jeff Golden
Josephine County, Board of Commissioners
Linn County, Board of Commissioners
Washington County, Department of Land Use and Transportation
City of Klamath Falls, Planning Director
City of Salem, Public Works Department
Confederated Tribe of Siletz Indians

Organizations

American Fisheries Society, Oregon Chapter
Associated Oregon Loggers
The Chamber of Medford/Jackson County
Coalition for Wise Forest Use
Douglas Timber Operators
Eastern Oregon Mining Association
Friends of Greensprings
Headwaters
Local Residents for Old Growth
Mazamas
National Association of Conservation Districts
National Audubon Society
National Council of the Paper Industry for Air and Stream Improvement
Northwest Environmental Defense Center
Northwest Federation of Mineralogical Societies
Northwest Forest Resource Council
Northwest Forestry Association
Northwest Rivers Council
North West Timber Association
Oregon Natural Resources Council
Oregon Rivers Council
Public Lands Foundation
Sierra Club, Oregon Chapter
Siskiyou Audubon Society
Southern Oregon Timber Industries Association
Umpqua Valley Audubon Society
Upper Cow Creek Community Center
Western Forest Industries Association
Western Wood Products Association
The Wilderness Society
Willamette Timberman Association

BLM Planning and Resource Interrelationships with Other Agencies

Interrelationships With Other Agencies

Interagency coordination with other federal, state, and local government agencies is required by BLM regulations (43 CFR Part 1610.3). Many formal coordination relationships between the BLM and these other government agencies or units have been established through memoranda of understanding (with Interior Department agencies) and interagency agreements (all discussed hereafter as agreements). A number of these have been approved by the director of the Bureau and are sufficiently detailed to preclude the need for state office or district office level agreements. Some national level agreements have local supplemental agreements between lower level units of agencies. In addition, the state director has approved independent state level agreements, while the district manager has approved agreements with county governments. In general, these agreements deal with mechanisms for coordination, consultation and documenting consistency and therefore do not constrain resource allocations or management direction unless they are non-discretionary—that is, mandated by federal law, executive order, or treaties. Some local agreements are very specific and involve techniques for managing public lands to meet detailed objectives for plant and animal habitat, research projects, big game transplants, or multi-purpose communication sites. Any agreement element which is discretionary can be modified as a consequence of the RMP decision making process. Such agreements normally contain standard "escape clauses" that come into operation in the event of inadequate funding, discovery of contradiction with federal law, or the need to amend or revise the agreement due to newly approved plans, changes in resource condition, etc.

Relevant coordination occurs with the following agencies regarding the activities noted:

U.S. Forest Service - regarding plans, activities, and projects on adjacent lands.

U.S. Fish and Wildlife Service - regarding plans and activities that may affect a federal threatened, endangered, or proposed threatened or endangered species or its critical habitat, or a federal candidate species.

Bonneville Power Administration - regarding improvement of riparian zones and anadromous fish habitat as part of the Columbia Basin Fish and Wildlife Program of the Northwest Power Planning Council as authorized by the National Power Planning Act. Also regarding identification and evaluation of regional utility corridor options.

U.S. Army Corps of Engineers - regarding the Corps' authority, under the Clean Water Act, to regulate the discharge of dredged or fill materials into any estuary or wetland or stream with a flow in excess of five cubic feet per second.

National Marine Fisheries Service - regarding planning and activities which may affect marine, estuarine or anadromous fish resources.

Soil Conservation Service - regarding the National Cooperative Soil Survey.

National Park Service - regarding planning and activities that could affect an identified inventory or study river's ability to meet Wild and Scenic Rivers Act eligibility or classification criteria.

Oregon Dept. of Fish and Wildlife - regarding planning and activities affecting wildlife (including fish) habitat.

Oregon Dept. of Forestry (OSDF) - regarding BLM compliance with the Oregon Forest Practices Act in the conduct of timber harvest, reforestation, road construction and maintenance, chemical applications, and slash disposal. Also regarding BLM compliance with the statewide Smoke Management Plan and Visibility Protection Plan under the umbrella of the Federal Clean Air Act. And regarding fire protection, for which OSDF is BLM's primary contractor in the planning area.

Oregon Dept. of Environmental Quality - regarding BLM compliance with the Statewide Water Quality Management Plan, under the umbrella of Section 208 of the Federal Clean Water Act. Also regarding treatment and control of water pollution sources where such may be associated with BLM facilities.

Oregon Energy Facility Siting Council - regarding any proposed power plant larger than 25 megawatts, proposed electric transmission line over 230 Kilovolts in capacity or proposed natural gas line at least 16 inches in diameter.

Oregon Dept. of Agriculture - regarding noxious weed control programs and the state endangered plant species program. BLM coordinates site-specific noxious weed control activities with local weed control districts.

Division of State Lands - regarding BLM compliance with Oregon's Removal-Fill law, which regulates removing and filling of materials from and in the waters of the state.

Highway Division, Oregon Dept. of Transportation - regarding road planning in the vicinity of federal and state highways. Similar cooperation takes place with county road departments regarding county road systems.

Oregon Dept. of Parks and Recreation - regarding management of BLM-administered land adjacent to state parks and state scenic waterways.

Oregon Dept. of Geology and Mineral Industries - regarding mined-land reclamation on BLM-administered lands.

State Historic Preservation Office - regarding sites protected by National Historic Preservation Act regulations.

Land Conservation and Development Commission, through the Department of Land Conservation and Development - regarding consistency of BLM plans and activities with the Oregon Coastal Management Program, under the umbrella of the Federal Coastal Zone Management Act.

Counties - regarding consistency of BLM plans with acknowledged county comprehensive plans, as well as regarding a variety of BLM plans and activities that may affect county road systems, county parks, and county natural resource management activities. BLM also participates in review of county planning actions in order to alert counties to potential conflicts and inconsistencies with BLM forest management plans or other plans.

The Resource Management Planning Process

The Resource Management Plan is a "Land Use Plan" as prescribed by the Federal Land Policy and Management Act. The RMP establishes in a written document:

1. Land areas for limited, restrictive, or exclusive resource uses or for transfer from BLM administration;
2. Allowable resource uses and related levels of production or use to be maintained;
3. Resource condition goals and objectives to be reached;
4. Program constraints and general management practices;
5. Identification of specific activity plans required;
6. Support actions required to achieve the above;
7. General implementation schedule; and
8. Intervals and standards for monitoring the plan to determine its effectiveness.

The underlying goal of the RMP is to provide efficient on the ground management of public lands and associated resources.

The procedure for preparing an RMP involves nine interrelated actions as shown in TableA. Some actions may occur simultaneously and it may be necessary to repeat an action if additional information becomes available. The plan that results from this process is a general decision document designed primarily to help district and area managers make decisions, and to guide the efforts of staff on a day to day basis. Where more detailed management direction is required, specific activity plans will be prepared after the RMP is completed.

Preparation of the Roseburg RMP was initiated in the fall of 1986, with public involvement in the identification of preliminary planning issues and concerns. The first four steps of the RMP process have been completed, except for any modifications that may occur as a result of public review of this summary or the full AMS.

After the plan is implemented, it will be monitored and evaluated on a continuing basis to assure that land management issues are being addressed as expected and that it is accomplishing its intended results.

Table A. Resource Management Planning Process

Step	Completion Target
1. Identification of Issues	Completed
2. Development of Planning Criteria	Completed
3. Inventory Data and Information Collection	Completed
4. Analysis of Management Situation	Completed
5. Formulation of Alternatives	Completed
6. Estimation of Effects	Completed
7. Selection of a Preferred Alternative	
a. Draft RMP/EIS	Completed
b. Final RMP/EIS	Spring 1993
8. Selection of the Resource Management Plan	Late 1993
9. Monitoring and Evaluation	Start 1994

Public involvement and consultation with affected state and local governments is required at several points in the RMP process. This consultation is essential so the final resource management plan will be as consistent as possible with state and local natural resource related plans, programs and policies.

Public Involvement Summary

Public involvement has been an integral part of BLM's resource management planning (RMP) process from the outset. To date public involvement activities have included a series of information mailers or brochures, public meetings, open houses, field trips, distribution of planning documents, document review and comment periods, informal contacts, group meetings, written letters and responses to comments. Our efforts began in May 1986 with a mailer that asked for comments on the type of public involvement activities that should be conducted in the planning process.

In September 1986, a district mailer outlined the overall planning schedule and requested comments on the first major planning step: Issue Identification. BLM invited the public to identify issues or concerns they believed should be addressed in the RMP process. A news release announcing this step was distributed to the news media. During this planning step, each western Oregon district hosted an open house to help acquaint local citizens with the planning process and schedule and to discuss issues related to the planning process. On September 30, 1986, thirty-six people attended an open house in the Roseburg District Office.

Building on public comments received during the issue identification step, BLM prepared and distributed another district mailer in March 1987, summarizing publicly identified issues and concerns. The mailer also addressed the second and third planning steps: Development of Planning Criteria, including State Director Guidance, and Collection of Inventory Data. The mailer included a schedule of public meetings and/or field trips hosted by each district to review and discuss the technical elements of inventory collection, particularly forest inventory techniques. The mailer also disclosed a proposed element of planning criteria by identifying a proposed timber harvest computer model, and an opportunity for public comment on the model. The Roseburg District hosted two field trips to discuss forest inventory techniques and BLM forest land classification procedures. The first trip on May 14, 1987 to the northern portion of the district was attended by 24 people representing a variety of interests and organizations. The next day a similar trip to the southern portion of the district was attended by six people. Both trips included a look at a variety of forest land classifications which generated considerable discussion and interaction among participants over the procedures used in the classification process. The field trips provided a forum by which complicated technical procedures could be discussed and demonstrated, and land and resource features could be examined first hand in actual field situations, rather than discussed in an abstract sense in an office environment.

In August 1987, BLM distributed another mailer dealing with Planning Criteria and proposed State Director Guidance. This mailer requested comments on relevant topics for State Director Guidance and included a schedule for public demonstration of the proposed timber harvest computer model. Demonstrations were conducted in Roseburg and Portland in September 1987. Fourteen people attended the Roseburg demonstration of the proposed TRIM-PLUS Allowable Harvest Model. The session included a comparative look and discussion of other harvest models with TRIM-PLUS and a demonstration of how the model works.

In January 1988 a mailer was distributed to inform the public of the upcoming availability of the State Director Guidance Document. Interested publics were asked to return a request to receive a copy of the document.

A draft State Director Guidance Document was mailed to all those who requested copies in May 1988. Additional copies were made available through all district offices, and open houses were held in each district and the state office. The Roseburg District held an open house attended by 22 people on June 9, 1988 to discuss the State Director Guidance Document. A comment period followed, with approximately 70 written responses sent to the state director by the end of August 1988. Proposed revisions to some elements of that guidance and responses to public comments were shared with the original respondents for further comment in several letters during 1989 and 1990.

The Roseburg District "Summary of the Management Situation" was published in February 1991. The Roseburg District held an open house to help explain and discuss the AMS. The Roseburg District received 33 public comment forms and letters containing 37 signatures in response to the AMS. The comments received by the public were used by the district RMP team in developing the preferred alternative. In March 1992, the Roseburg District sent out about 900 newsletters to individuals and organizations summarizing the public comments that were received on the AMS, informing them of the status of the planning process, and requesting a response from those who desired to receive either a full Draft RMP/EIS document or summary document of the Draft RMP/EIS.

Acronyms
Glossary
References Cited
Index

Acronyms

ACE	Allowable Cut Effect
ACEC	Area of Critical Environment Concern
ACMP	Area of Critical Mineral Potential
ADS	Automated Digitizing System
AI	Slope Index
AMS	Analysis of the Management System
APD	Application for Permit to Drill
AQMA	Air Quality Management Area
ARD	Automated Resource Data
ARPA	Archeological Resources Protection Act
ASQ	Allowable Sale Quantity
AUM	Animal Unit Month
BLM	Bureau of Land Management
BMP	Best Management Practices
BRU	Basic Resource Unit
CBWR	Coos Bay Wagon Road
CCD	Coos, Curry, and Douglas County (Business Development Corporation)
CEQ	Council of Environmental Quality
Cf	Cubic Feet
CFI	Continuous Forest Inventory
CFL	Commercial Forest Land
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CMAI	Culmination of Mean Annual Increment
COPE	Coastal Oregon Productivity Enhancement
CSU	Controlled Surface Use
DBH	Diameter Breast Height
DDT	Dichloro-Diphenye-Tricholorethene
DEIS	Draft Environmental Impact Statement
DEQ	Department of Environmental Quality
DI	Density Index
DOT	United States Department of Transportation
EA	Environmental Assessment
EEA	Environmental Education Area
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
EQC	Environmental Quality Commission
ERMA	Extensive Recreation Management Area
ESA	Endangered Species Act
ESC	Existing Stand Condition
FEIS	Final Environmental Impact Statement
FERC	Federal Energy Regulatory Commission
FHA	Federal Highway Administration
FI	Flow Index
FLPMA	Federal Land Policy and Management Act
FOI	Forest Operations Inventory
FOOGLRA	Federal Onshore Oil and Gas Leasing Reform Act
FPHT	Forest Products Harvest Tax
FY	Fiscal Year
GFMA	General Forest Management Area
GIS	Geographic Information System
HCA	Habitat Conservation Area
HMP	Habitat Management Plan
IDT	Interdisciplinary Team
IPM	Integrated Pest Management
ISC	Interagency Scientific Committee
JTU	Jackson Turbidity Unit
KGRA	Known Geothermal Resource Area

LEIS	Legislative Environmental Impact Statement
LTSY	Long-Term Sustained Yield
LWD	Large Woody Debris
MBF	Thousand Board Feet
MFP	Management Framework Plan
Mg/l	Milligrams per Liter
MHA	Minimum Harvest Age
MI	Mining Index
MI	Management Intensity
MMBF	Million Board Feet
MMCF	Million Cubic Feet
MOSS	Map Overlay and Statistical System
MOU	Memorandum of Understanding
MTP	Master Title Plat
MWS	Municipal Watershed
NA	No Action
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NOS	Notice of Staking
NPPC	Northwest Power Planning Council
NPS	Nonpoint Source
NSO	No Surface Occupancy
NTL	Notice to Lease
NTU	Nephelometric Turbidity Unit
NWSRS	National Wild and Scenic River System
O&C	Oregon and California Act of 1937 (Revested Oregon and California Railroad and Reconveyed Coos Bay Wagon Road Grant Lands)
ODF	Oregon Department of Forestry
ODFW	Oregon Department of Fish and Wildlife
OFPA	Oregon Forest Practices Act
OGEA	Old-Growth Emphasis Area
OI	Operations Inventory
ONA	Outstanding Natural Area
ONHP	Oregon Natural Heritage Plan
ORS	Oregon Revised Statutes
ORV	Off-Road Vehicle
ORV	Outstanding Remarkable Values
OSB	Oriented Strand Board
OSU	Oregon State University
PA	Preferred Alternative
PCT	Precommercial Thinning
PD	Public Domain
PI	Precipitation Index
PL	Public Law
PLS	Public Land Survey
PNW	Pacific Northwest Research Station
PM	Particulate Matter
PM 10	Particulate Matter 10 Microns or Smaller
PPB	Parts Per Billion
PPM	Parts Per Million
R&PP	Recreation and Public Purpose
R and R	Restoration and Retention Blocks
RI	Riparian Index
RIA	Rural Interface Area
RMA	Riparian Management Area
RMP	Resource Management Plan
RNA	Research Natural Area
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
SCFL	Suitable Commercial Forest Land
SCORP	Statewide Comprehensive Outdoor Recreation Plan

SCS	Soil Conservation Service
SDI	Soil Disturbance Index
SI	Silvicultural Index
SIP	State Implementation Plan
SMP	Smoke Management Plan
SRMA	Special Recreation Management Area
SWL	Suitable Woodland
SYU	Sustained Yield Unit
T&E	Threatened and Endangered (species)
TMDL	Total Maximum Daily Load
TMP	Timber Management Plan
TPCC	Timber Production Capability Classification
Ug/l	Micrograms per Liter
uS	Conductivity as Measured in Micro Siemens
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USDA	United States Department of Agriculture
USDI	United States Department of Interior
VI	Vegetation Index
VRM	Visual Resource Management
WCI	Watershed Condition Index
WODDB	Western Oregon Digital Data Base
WRRI	Water Resources Research Institute
WSA	Wilderness Study Area
WSR	Wild and Scenic River
WSRA	Wild and Scenic Rivers Act

Glossary

Activity Plan - A document which describes management objectives, actions, and projects to implement decisions of the RMP or other planning documents. Usually prepared for one or more resources in a specific area.

Age Class - One of the intervals into which the age range of trees is divided for classification or use.

Airshed - A geographical area which shares the same air mass due to topography, meteorology, and climate.

Allowable Cut Effect (ACE) - The immediate increase in the current allowable sale quantity which is justified by expected future increases in yields due to present or proposed management treatments.

Allowable Sale Quantity (ASQ) - The gross amount of timber volume, including salvage, that may be sold annually from a specified area over a stated period of time in accordance with the management plan. Formerly referred to as "allowable cut."

Anadromous Fish - Fish that migrate as adults from the ocean into fresh water streams to reproduce young which return to the ocean to grow to maturity.

Analysis of the Management Situation (AMS) - A document that summarizes important information about existing resource conditions, uses and demands, as well as existing management activities. It provides the baseline for subsequent steps in the planning process, such as the design of alternatives and affected environment.

Analytical Watershed - For planning purposes, a drainage basin subdivision of the planning area used for analyzing cumulative impacts on resources.

Animal Damage -Injuries inflicted upon forest tree seed, seedlings, and young trees through seed foraging, browsing, cutting, rubbing, or trampling; usually by mammals and birds.

Animal Unit Month (AUM) - The amount of forage necessary for the sustenance of one cow or its equivalent for one month.

Aquatic Habitat - Habitat that occurs in free water.

Archaeological Site - A geographic locale that contains the material remains of prehistoric and/or historic human activity.

Area of Critical Environmental Concern (ACEC) - An area of BLM-administered lands where special management attention is needed to protect and prevent irreparable damage to important historic, cultural or scenic values, fish and wildlife resources or other natural systems or processes; or to protect life and provide safety from natural hazards. (Also see Potential ACEC.)

Area of Critical Mineral Potential - An area nominated by the public as having mineral resources or potential important to the local, regional, or national economy.

Area Regulation - A method of scheduling timber harvest based on dividing the total acres by an assumed rotation.

Automated Resource Data (ARD) - Computerized map data used for the management of resources.

Available Forest Land - That portion of the forested acres for which timber production is planned and included within the acres contributing to the allowable sale quantity (ASQ). This includes both lands allocated primarily to timber production and lands on which timber production is a secondary objective.

Back Country Byway - A road segment designated as part of the National Scenic Byway System.

Basal Area - The area of the cross section of a tree stem near its base, generally at breast height, 4.5 feet above the ground and inclusive of bark.

Baseline - The starting point for analysis of environmental consequences; may be the conditions at a point in time (e.g., when inventory data is collected) or may be the average of a set of data collected over a specified period of years.

Basic Resource Unit (BRU) - A term used in TRIM-PLUS for the smallest unit of timberland that has been identified in the inventory.

Basin Programs - Sets of state administrative rules that establish types and amounts of water uses allowed in the state's major river basins and form the basis for issuing water rights.

Beneficial Use - The reasonable use of water for a purpose consistent with the laws and best interest of the peoples of the state. Such uses include, but are not limited to, the following: instream, out of stream and groundwater uses, domestic, municipal, industrial water supply, mining, irrigation, livestock watering, fish and aquatic life, wildlife, fishing, water contact recreation, aesthetics and scenic attraction, hydropower, and commercial navigation.

Best Management Practices (BMP) - Methods, measures, or practices designed to prevent or reduce water pollution. Not limited to structural and nonstructural controls, and procedures for operations and maintenance. Usually, BMPs are applied as a system of practices rather than a single practice.

Big Game - Large mammals that are hunted, such as Roosevelt elk, black-tailed deer and black bear.

Biological Corridor - A habitat band linking areas reserved from substantial disturbance.

Biological Diversity - The variety of life and its processes.

Biological Legacies - Large trees, down logs, snags, and other components of the forest stand left after harvesting for the purpose of maintaining site productivity and providing structures and ecological functions in subsequent stands.

Board Foot (BF) - A unit of solid wood, one foot square and one inch thick.

Broadcast Burning - A controlled fire that burns within defined boundaries to achieve management objectives.

Bureau Assessment Species - Plant and animal species on List 2 of the Oregon Natural Heritage Data Base, or those species on the Oregon List of Sensitive Wildlife Species (OAR 635-100-040), which are identified in BLM Instruction Memo No. OR-91-57, and are not included as federal candidate, state listed or Bureau sensitive species.

Bureau Sensitive Species - Plant or animal species eligible for federal listed, federal candidate, state listed, or state candidate (plant) status, or on List 1 in the Oregon Natural Heritage Data Base, or approved for this category by the State Director.

Candidate Species - Those plants and animals included in Federal Register "Notices of Review" that are being considered by the Fish and Wildlife Service (FWS) for listing as threatened or endangered. There are two categories that are of primary concern to BLM. These are:

> Category 1. Taxa for which the FWS has substantial information on hand to support proposing the species for listing as threatened or endangered. Listing proposals are either being prepared or have been delayed by higher priority listing work.
>
> Category 2. Taxa for which the FWS has information to indicate that listing is possibly appropriate. Additional information is being collected.

Casual Use - Activities ordinarily resulting in negligible disturbance of federal lands and resources.

Cavity Excavator - A wildlife species that digs or chips out cavities in wood to provide a nesting, roosting, or foraging site.

Cavity Nester - A wildlife species that nests in cavities.

Characteristic Landscape - The established landscape within an area being viewed. This does not necessarily mean a naturalistic character. It could refer to an agricultural setting, an urban landscape, a primarily natural environment, or a combination of these types.

Class I (air quality) Areas - Special areas (i.e., national parks, certain wilderness areas) protected for their air quality related values.

Clearcut Harvest - A timber harvest method in which all trees are removed in a single entry from a designated area, with the exception of wildlife trees or snags, to create an even-aged stand.

Closed Discretionary - Areas closed to mineral exploration and development by authority of law or regulation, but where such lands can be opened by action of BLM without legislation, regulation change, Secretarial decision of Executive Order.

Closed Nondiscretionary - Areas specifically closed to mineral exploration and development by authority of law, regulation, Secretarial decision (including Public Land Orders), or Executive Order.

Coastal Oregon Productivity Enhancement Program (COPE) - A cooperative research and education program to identify and evaluate existing and new opportunities to enhance long-term productivity and economic/social benefits derived from the forest resources of coastal Oregon.

Commercial Forest Land - Forest land producing or capable of producing at least 20 cubic feet of wood per acre per year of commercial tree species.

Commercial Thinning - Partial cuttings in merchantable timber stands to increase merchantable yield by redistributing growth and salvaging existing and expected mortality.

Commercial Tree Species - Conifer species used to calculate the commercial forest land ASQ. They are typically utilized as saw timber and include species such as Douglas-fir, hemlock, spruce, fir, pine and cedar. (Also see Noncommercial Tree Species).

Commodity Resources - Goods or products of economic use or value.

Community Stability - The capacity of a community (incorporated town or county) to absorb and cope with change without major hardship to institutions or groups within the community.

Community Water System - See Public Water System.

Concern - A topic of management or public interest that is not well enough defined to become a planning issue, or does not involve controversy or dispute over resource management activities or land use allocations or lend itself to designating land use alternatives. A concern may be addressed in analysis, background documents, or procedures or in a noncontroversial decision.

Consistency - Under the Federal Land Policy and Management Act, the adherence of BLM resource management plans to the terms, conditions and decisions of officially approved and adopted resource related plans, or in their absence, with policies and programs of other federal agencies, state and local governments and Indian tribes, so long as the plans are also consistent with the purposes, policies and programs of federal laws and regulations applicable to BLM-administered lands. Under the Coastal Zone Management Act, the adherence to approved state management programs to the maximum extent practicable, of federal agency activities affecting the defined coastal zone.

Constrained Timber Production Base - Acreage managed for timber production at less than full intensity in consideration of nontimber resource management objectives.

Coos Bay Wagon Road (CBWR) Lands - Public lands granted to the Southern Oregon Company and subsequently reconveyed to the United States.

Core Area - That area of habitat essential in the breeding, nesting and rearing of young, up to the point of dispersal of the young.

Cover - Vegetation used by wildlife for protection from predators, or to mitigate weather conditions, or to reproduce.

Critical Habitat - (1) Specific areas within the geographic area occupied by a threatened or endangered species at the time it is listed. These areas must have physical or biological features (a) essential to the conservation of the species, and, (b) which may require special management considerations or protection. (2) Specific areas outside the geographical area occupied by a threatened or endangered species at the time it is listed determined by the Secretary to be essential for the conservation of the species.

Crucial Habitat - Habitat which is basic to maintaining viable populations of fish or wildlife during certain seasons of the year or specific reproduction periods.

Cubic Foot - A unit of solid wood, one foot square and one foot thick.

Cull - A tree or log which does not meet merchantable specifications.

Culmination of Mean Annual Increment (CMAI) - The peak of average yearly growth in volume of a forest stand (total volume divided by age of stand).

Cultural Resource - Any definite location of past human activity identifiable through field survey, historical documentation, or oral evidence; includes archaeological or architectural sites, structures, or places, and places of traditional cultural or religious importance to specified groups whether or not represented by physical remains.

Cultural Site - Any location that includes prehistoric and/or historic evidence of human use or that has important sociocultural value.

Cumulative Effect - The impact which results from identified actions when they are added to other past, present, and reasonably foreseeable future actions regardless of who undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

Debris Torrent - A fluid mass of soil, rock and vegetative debris that moves rapidly down stream channels.

Density Management - Cutting of trees for the primary purpose of widening their spacing so that growth of remaining trees can be accelerated. Density management harvest can also be used to improve forest health, to open the forest canopy, or to accelerate the attainment of old growth characteristics if maintenance or restoration of biological diversity is the objective.

Departure (from even flow) - A timber sale level which deviates from sustainable sale levels through a planned temporary increase or decrease in the ASQ. Must be economically and biologically justified.

Designated Area - An area identified in the Oregon Smoke Management Plan as a principal population center requiring protection under state air quality laws or regulations.

Developed Recreation Site - A site developed with permanent facilities designed to accommodate recreation use.

Diameter At Breast Height (dbh) - The diameter of a tree 4.5 feet above the ground.

Dispersed Recreation - Outdoor recreation in which visitors are diffused over relatively large areas. Where facilities or developments are provided, they are primarily for access and protection of the environment rather than comfort or convenience of the user.

Domestic Water Supply - Water used for human consumption.

Dominant Use - The guiding principle for the management of all O&C lands inventoried as "suitable commercial forest land" whereby such lands are to be managed primarily for timber production on a sustained yield basis with due consideration for the other forest uses identified in the O&C Act and subject to any relevant requirements specified in subsequent legislation. (Examples of such subsequent legislation are the Endangered Species Act and the Federal Water Pollution Control Act).

Early Seral Stage - See Seral Stages.

Ecological Forestry - A set of forest management concepts which seek to maintain or recreate timber stand and landscape biological diversity. Also termed "New Perspectives", "New Forestry" and "Sustainable Forestry."

Ecosystem Diversity - The variety of species and ecological processes that occur in different physical settings.

Economically Feasible - Having costs and revenues with a present net value greater than zero.

Edge Effect - An ecologically important biological effect which occurs in the transition zone where two plant communities or successional stages meet and mix.

Effective Old-Growth Habitat - Old-growth forest largely unmodified by external environmental influences (for example, wind, temperature, encroachment of nonresident species) from nearby, younger forest stands. Also referred to as interior habitat. For purposes of analysis, assumed to be at least 400 feet from an edge with an adjacent stand younger than age class 70.

Eligible River - A river or river segment found, through interdisciplinary team and, in some cases, interagency review, to meet Wild and Scenic River Act criteria of being free-flowing and possessing one or more outstandingly remarkable values.

Endangered Species - Any species defined through the Endangered Species Act as being in danger of extinction throughout all or a significant portion of its range and published in the Federal Register.

Environmental Assessment (EA) - A systematic analysis of site-specific BLM activities used to determine whether such activities have a significant effect on the quality of the human environment and whether a formal environmental impact statement is required; and to aid an agency's compliance with NEPA when no EIS is necessary.

Environmental Impact - The positive or negative effect of any action upon a given area or resource.

Environmental Impact Statement (EIS) - A formal document to be filed with the Environmental Protection Agency that considers significant environmental impacts expected from implementation of a major federal action.

Established Stand - A reforestation unit of suitable trees which are past the time when considerable juvenile mortality occurs. The unit is no longer in need of measures to ensure survival but is evaluated for measures to enhance growth.

Even-Aged Management - A silvicultural system which creates forest stands that are primarily of a single age or limited range of ages. Creation of even-aged stands may be accomplished through the clearcut, seed tree or shelterwood methods.

Existing Stand Condition (ESC) - An artificial classification that groups forest stands with similar management potential into categories matched to tables expressing yield at various stand ages under various combinations of silvicultural treatment.

Extensive Recreation Management Areas (ERMA) - All BLM-administered lands outside Special Recreation Management Areas. These areas may include developed and primitive recreation sites with minimal facilities.

50-11-40 Rule - A proposed guideline requiring maintenance of adequate spotted owl dispersal habitat on lands outside designated "habitat conservation areas" for the Northern Spotted Owl. It would assure that, on the quarter township basis, 50 percent of the stands would have conifers averaging 11 inches dbh and a 40 percent canopy closure.

Forest Canopy - The cover of branches and foliage formed collectively by the crowns of adjacent trees and other woody growth.

Forest Land - Land that is now, or is capable of becoming, at least l0 percent stocked with forest trees and that has not been developed for nontimber use.

Forest Succession - The orderly process of change in a forest as one plant community or stand condition is replaced by another, evolving towards the climax type of vegetation.

Fragile Nonsuitable - A TPCC classification indication forest land having fragile conditions, which, if harvested, would result in reduced future productivity; even if special harvest or restrictive measures are applied. These fragile conditions are related to soils, geologic structure, topography, and ground water.

Full Log Suspension - Suspension of the entire log above the ground during yarding operations.

Genetic Diversity - The variety within populations of a species.

Green Tree Retention - A stand management practice in which live trees as well as snags and large down wood, are left as biological legacies within harvest units to provide habitat components over the next management cycle.

> High Level - A regeneration harvest designed to retain the highest level of live trees possible while still providing enough disturbance to allow regeneration and growth of the naturally occurring mixture of tree species. Such harvest should allow for the regeneration of intolerant and tolerant species. Harvest design would also retain cover and structural features necessary to provide foraging and dispersal habitat for mature and old growth dependant species.
>
> Low Level - A regeneration harvest designed to retain only enough green trees and other structural components (snag , coarse woody debris, etc.) to result in the development of stands which meet old growth definitions within 100 to 120 years after harvest entry, considering overstory mortality.

Gross Yarding - Removal of all woody material of specified size from a logging unit to a landing.

Group Resource Unit (GRU) - A term used in TRIM-PLUS for each collection of current and future management instructions and data sources for the Basic Resource Units which are proposed to be managed to meet a particular set of management objectives.

Habitat Diversity - The number of different types of habitat within a given area.

Habitat Fragmentation - The breaking up of habitat into discrete islands through modification or conversion of habitat by management activities.

Habitat Management Plan - See Activity Plan.

Hardwood Site - A forest site occupied by hardwoods that is unsuitable for the production of conifer species.

Hazardous Materials - Anything that poses a substantive present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of or otherwise managed.

Hiding Cover - Generally, any vegetation used by wildlife for security or to escape from danger; however, more specifically, any vegetation capable of providing concealment (e.g. hiding 90 percent of an animal) from human view at a distance of 200 feet or less.

Historic Site - A cultural resource resulting from activities or events dating to the historic period (generally post AD l830 in western Oregon).

Home Range - The area which an animal traverses in the scope of normal activities; not to be confused with territory which is the area an animal defends.

Impact - A spatial or temporal change in the environment caused by human activity.

Improved Seed - Seed originated from a seed orchard or selected tree(s) whose genetic superiority in one or more characters important to forestry has been proven by tests conducted in specific environments.

Infiltration (soil) - The movement of water through the soil surface into the soil.

Instant Study Area - A natural area formally identified by BLM for accelerated wilderness review, by notice published before October 21, 1975.

Integrated Pest Management (IPM) - A systematic approach that uses a variety of techniques to reduce pest damage or unwanted vegetation to tolerable levels. IPM techniques may include natural predators and parasites, genetically resistant hosts, environmental modifications and, when necessary and appropriate, chemical pesticides or herbicides.

Integrated Vegetation Management - See Integrated Pest Management.

Intensive Forest Management Practices - The growth enhancing practices of release, precommercial thinning, commercial thinning, and fertilization, designed to obtain a high level of timber volume or quality.

Intensive Timber Production Base - All commercial forest land allocated to timber production and intensively managed to obtain a high level of timber volume or quality.

Intensively Managed Timber Stands - Forest stands managed to obtain a high level of timber volume or quality through investment in growth enhancing practices, such as precommercial thinning, commercial thinning, and fertilization. Not to be confused with the allocations of "lands available for intensive management of forest products."

Intermittent Stream - A stream which flows most of the time but occasionally is dry or reduced to pools.

Inventory River - A potential wild, scenic, or recreational river identified in the 1982 National Rivers Inventory (NRI) published by the National Park Service.

Irreversible or Irretrievable Commitment of Resources - Effect of an action or inaction which cannot be reversed within a reasonable time.

Issue - A matter of controversy or dispute over resource management activities that is well defined or topically discrete. Addressed in the design of planning alternatives.

Landing - Any place on or adjacent to the logging site where logs are assembled for further transport.

Landscape Diversity - The size, shape and connectivity of different ecosystems across a large area.

Landscape Features - The land and water form, vegetation, and structures which compose the characteristic landscape.

Large Woody Debris - Pieces of wood larger than ten feet long and six inches in diameter, in a stream channel.

Large Woody Material - Logs on the forest floor in pieces at least 24 inches in diameter at the large end.

Late Seral Stage - See Seral Stages.

Leasable Minerals - Minerals which may be leased to private interests by the federal government. Includes oil, gas, geothermal resources, and coal.

Locatable Minerals - Minerals subject to exploration, development and disposal by staking mining claims as authorized by the Mining Law of l872 (as amended). This includes valuable deposits of gold, silver, and other uncommon minerals not subject to lease or sale.

Log Decomposition Class - Any of five stages of deterioration of logs in the forest; stages range from essentially sound (class 1) to almost total decomposition (class 5).

Long-Term - The period starting l0 years following implementation of the Resource Management Plan. For most analyses, long-term impacts are defined as those existing 100 years after implementation.

Long-Term Soil Productivity - The ability of a soil to sustain a nondeclining yield of a timber crop in perpetuity and retain the potential for the targeted species to be grown at the same stocking level and growth rate after each rotation.

Long-Term Sustained Yield (LTSY) - Estimated timber harvest that can be maintained indefinitely, once all stands have been converted to a managed state under a specific management intensity.

Lumber and Wood Products, Except Furniture - An industrial classification which includes logging contractors engaged in cutting timber and pulpwood: merchant sawmills, lath mills, shingle mills, planing mills, plywood mills, and veneer mills engaged in producing lumber and wood basic materials; and establishments engaged in manufacturing finished articles made entirely or mainly of wood or wood substitutes. Certain types of establishments producing wood products are classified elsewhere, e.g., furniture and office and store fixtures are in a different classification.

Major Plant Grouping - An aggregation of plant associations with similar management potential and with the same dominant late seral conifer species and the same major early seral species. Late seral rather than climax species are used because late seral species are usually present rather than climax communities and because most old-growth plant communities on BLM-administered lands are made up of late seral species rather than climax species in the upper canopy.

Management Activity - An activity undertaken for the purpose of harvesting, traversing, transporting, protecting, changing, replenishing, or otherwise using resources.

Management Framework Plan (MFP) - A land use plan that established coordinated land use allocations for all resource and support activities for a specific land area within a BLM district. It established objectives and constraints for each resource and support activity and provided data for consideration in program planning. This process has been replaced by the Resource Management Planning process.

Management Intensity (MI) - An expression of a potential type of management for a Group Resource Unit in TRIM-PLUS, expressed as a yield table.

Mass Movement - The downslope movement of earth caused by gravity. Includes but is not limited to landslides, rock falls, debris avalanches, and creep. It does not, however, include surface erosion by running water.

Mature Seral Stage - See Seral Stages.

Micro*Storms - A micro-computer database system providing background information and recommended treatment for each operations inventory unit.

Mid Seral Stage - See Seral Stages.

Mineral Estate - The ownership of the minerals at or beneath the surface of the land.

Mineral Potential Classification System - Method for assessing the potential for the presence of a concentration of one or more energy and/or mineral resources.

Minimum Harvest Age - The lowest age of a forest stand to be scheduled for final harvest.

Minimum Stocking - Reforestation level lower than target stocking. Does not achieve full site occupancy in young stands but is capable of achieving optimal final harvest yield and reduced commercial thinning yield.

Minimum Streamflow - The quantity of water needed to maintain the existing and planned in-place uses of water in or along a stream channel or other water body and to maintain the natural character of the aquatic system and its dependent systems.

Mining Claims - Portions of public lands claimed for possession of locatable mineral deposits, by locating and recording under established rules and pursuant to the 1872 Mining Law.

Mitigating Measures - Modifications of actions which (a) avoid impacts by not taking a certain action or parts of an action; (b) minimize impacts by limiting the degree or magnitude of the action and its implementation; (c) rectify impacts by repairing, rehabilitating or restoring the affected environment; (d) reduce or eliminate impacts over time by preservation and maintenance operations during the life of the action; or (e) compensate for impacts by replacing or providing substitute resources or environments.

Monitoring/Evaluation - The orderly collection and analysis of data to evaluate the progress and effectiveness of on-the-ground actions in meeting resource management objectives.

Mortality Salvage - The harvest of dead and dying timber.

Multi-aged Stand - A forest stand which has more than one distinct age class arising from specific disturbance and regeneration events at various times. These stands normally will have multi-layered structure.

Multi-layered Canopy - Forest stands with two or more distinct tree layers in the canopy; also called multistoried stands.

Multiple Use - Management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; the use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historical values; and harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output.

Mycorrhizal Fungi - Fungi with a symbiotic relationship with the roots of certain plants.

National Ambient Air Quality Standards (NAAQS) - Standards designed to protect public health and welfare, allowing an adequate margin of safety. For particulate matter less than 10 microns in size (PM_{10}), 50 micrograms per cubic meter annual average and 150 micrograms per cubic meter, 24-hour average, not to be exceeded more than once per year.

National Register of Historic Places - A formal list established by the National Historic Preservation Act of 1966 of cultural resources worthy of preservation. The Register is maintained by the National Park Service; and lists archaeological, historic, and architectural properties.

Nonattainment - Failure of a geographical area to attain or maintain compliance with ambient air quality standards.

Nonattainment Area - A geographical area that has failed to attain or maintain compliance with air quality standards. Nonattainment area boundaries are commonly the same as city, standard metropolitan statistical area or county boundaries.

Nonchargeable Volume - Timber harvest not included in the allowable sale quantity calculations.

Noncommercial Forest Land - Land incapable of yielding at least 20 cubic feet of wood per acre per year of commercial species; or land which is capable of producing only noncommercial tree species.

Noncommercial Tree Species - Minor conifer and hardwood species whose yields are not reflected in the commercial conifer forest land ASQ. Some species may be managed and sold under a suitable woodland ASQ and, therefore, may be commercial as a woodland species.

Nonforest Land - Land developed for nontimber uses or land incapable of being 10 percent stocked with forest trees.

Nongame Wildlife - All wild vertebrate and invertebrate animals not subject to sport hunting.

Nonpoint Source Pollution - Water pollution that does not result from a discharge at a specific, single location (such as a single pipe) but generally results from land runoff, precipitation, atmospheric deposition or percolation, and normally is associated with agricultural, silvicultural and urban runoff, runoff from construction activities, etc. Such pollution results in the human-made or human-induced alteration of the chemical, physical, biological, radiological integrity of water.

Nonsuitable Commercial Forest Land - Sites that would take longer than 15 years to meet or exceed minimum stocking levels of commercial species. Further classified as suitable woodland.

Nonsuitable Woodland - All fragile nonsuitable forest land.

Noxious Plant - A plant specified by law as being especially undesirable, troublesome, and difficult to control.

Noxious Weed - See Noxious Plant.

Nutrient Cycling - Circulation or exchange of elements such as nitrogen and carbon between nonliving and living portions of the environment. Includes all mineral and nutrient cycles involving mammals and vegetation.

Nutrient Depletion - Detrimental changes on a site in the total amount of nutrients and/or their rates of input, uptake, release, movement, transformation, or export.

O&C Lands - Public lands granted to the Oregon and California Railroad Company and subsequently revested to the United States.

Obligate Species - A plant or animal that occurs only in a narrowly defined habitat such as tree cavity, rock cave, or wet meadow.

Off-Road Vehicle (ORV) - Any motorized track or wheeled vehicle designed for cross country travel over natural terrain.

Off-Road Vehicle Designation

> Open: Designated areas and trails where off-road vehicles may be operated subject to operating regulations and vehicle standards set forth in BLM Manuals 8341 and 8343.
>
> Limited: Designated areas and trails where off-road vehicles are subject to restrictions limiting the number or types of vehicles, date, and time of use; limited to existing or designated roads and trails.
>
> Closed: Areas and trails where the use of off-road vehicles is permanently or temporarily prohibited. Emergency use is allowed.

Old-Growth Conifer Stand - Older forests occurring on western hemlock, mixed conifer, or mixed evergreen sites which differ significantly from younger forests in structure, ecological function, and species composition. Old growth characteristics begin to appear in unmanaged forests at 175-250 years of age. These characteristics include (a) a patchy, multi-layered canopy with trees of several age classes; (b) the presence of large living trees; (c) the presence of larger standing dead trees (snags) and down woody debris, and (d) the presence of species and functional processes which are representative of the potential natural community.

For purposes of inventory, old-growth stands on BLM-administered lands are only identified if they are at least ten percent stocked with trees of 200 years or older and are ten acres or more in size. For purposes of habitat or biological diversity, the BLM uses the appropriate minimum and average definitions provided by Pacific Northwest Experiment Station publications 447 and GTR-285. This definition is summarized from the 1986 interim definitions of the Old-Growth Definitions Task Group.

Old-Growth Seral Stage - See Seral Stages.

Old-Growth-Dependent Species - An animal species so adapted that it can exist only in old growth forests.

Open Additional Restrictions - Areas open to mineral exploration and development subject to additional restrictions that can be legally required by BLM pursuant to law, regulation, or other legal authority such as ACEC designation, ORV or other closure order, community pit designation, etc.

Open Standard Requirements - Areas open to mineral exploration and development subject only to requirements over which BLM has no discretionary control such s the Clean Air/Clean Water Acts, National Environmental Policy Act, Resource Conservation and Recovery Act, Coastal Zone Management Act, Endangered Species Act, National Historic Preservation Act, etc.

Operations Inventory (OI) - An intensive, site-specific forest inventory of forest stand location, size, silvicultural needs, and recommended treatment based on individual stand conditions and productivity.

Operations Inventory Unit - An aggregation of trees occupying an area that is sufficiently uniform in composition, age, arrangement and condition to be distinguishable from vegetation on adjoining areas.

Optimal Cover - For elk, cover used to hide from predators and avoid disturbances, including man. It consists of a forest stand with four layers and an overstory canopy which can intercept and hold a substantial amount of snow, yet has dispersed, small openings. It is generally achieved when the dominant trees average 21 inches dbh or greater and have 70 percent or greater crown closure.

Outstanding Natural Area (ONA) - An area that contains unusual natural characteristics and is managed primarily for educational and recreational purposes.

Outstandingly Remarkable Values (ORV) - Values among those listed in Section 1 (b) of the Wild and Scenic Rivers Act: "scenic, recreational, geological, fish and wildlife, historical, cultural, or other similar values ..." Other similar values which may be considered include ecological, biological or botanical, paleontological, hydrological, scientific or research.

Overstory Removal - The final stage of cutting where the remaining overstory trees are removed to allow the understory to grow. Overstory removal is generally accomplished three to five years after reforestation and when adequate stocking has been achieved.

Paper and Allied Products - An industrial classification which includes establishments primarily engaged in the manufacture of pulps from wood and other cellulose fibers, and from rags; the manufacture of paper and paperboard; and the manufacture of paper and paperboard into converted products, such as paper coated off the paper machine, paper bags, paper boxes, and envelopes.

Partial Cutting - Removal of selected trees from a forest stand.

Partial Log Suspension - During yarding operations, suspension of one end of the log above the ground.

Particulates - Finely divided solid or liquid (other than water) particles in the air.

Peak Flow - The highest amount of stream or river flow occurring in a year or from a single storm event.

Perennial Stream - A stream that has running water on a year round basis.

Personal Income - The income received by all individuals in the economy from all sources. Made up of wages and salaries, proprietors income, rental income, dividends, personal interest income, and the difference between transfer payments (payouts) and personal contributions for social insurance.

Plan Amendment - A change in the terms, conditions or decisions of a resource management plan.

Plan Maintenance - Any documented minor change which interprets, clarifies, or refines a decision within a resource management plan but does not change the scope or conditions of that decision.

Plan Revision - A new resource management plan prepared by following all steps required by the regulations for preparing an original resource management plan.

Planning Area - All of the lands within the BLM management boundary addressed in a BLM resource management plan; however, BLM planning decisions apply only to BLM-administered lands and mineral estate.

Planning Issue - See Issue.

Plant Association - A plant community type based on land management potential, successional patterns, and species composition.

Plant Community - An association of plants of various species found growing together in different areas with similar site characteristics.

Plantation Maintenance- Actions in an unestablished forest stand to promote the survival of desired crop trees.

Plantation Release - All activities associated with promoting the dominance and/or growth of desired tree species within an established forest stand.

Pool/Riffle Ratio - The ratio of surface area or length of pools to the surface area or length of riffles in a given stream reach; frequently expressed as the relative percentage of each category. Used to describe fish habitat rearing quality.

Potential ACEC - An area of BLM-administered land that meets the relevance and importance criteria for ACEC designation, as follows:

> (1) Relevance. There shall be present a significant historic, cultural, or scenic value; a fish or wildlife resource or other natural system or process; or natural hazard.
>
> (2) Importance. The above described value, resource, system, process, or hazard shall have substantial significance and values. This generally requires qualities of more than local significance and special worth, consequence, meaning, distinctiveness, or cause for concern. A natural hazard can be important if it is a significant threat to human life or property.

Potential Natural Community - The community of plants and wild animals which would become established if all successional sequences were completed without interference by man under present environmental conditions. For forest communities, the potential natural community is an old-growth conifer stand.

Precommercial Thinning - Removing premerchantable conifers to control density and species composition and to concentrate growth on a desired number of potential crop trees.

Prescribed Fire - Introduction of fire under controlled conditions for management purposes.

Prevention Strategy(ies) - The amelioration of conditions that cause or favor the presence of competing or unwanted vegetation.

Priority Animal Taxa - Species or subspecies having special significance for management. They include endangered, threatened and special status species; species of high economic or recreation value; and species of significant public interest.

Priority Habitats - Aquatic, wetland and riparian habitats, and habitats of priority animal taxa.

Progeny Test Site - A test area for evaluating parent seed trees by comparing the growth of their offspring seedlings.

Proposed Threatened or Endangered Species - Plant or animal species proposed by the U.S. Fish & Wildlife Service to be biologically appropriate for listing as threatened or endangered, and published in the Federal Register. It is not a final designation.

Public Domain Lands - Original holdings of the United States never granted or conveyed to other jurisdictions, or reacquired by exchange for other public domain lands.

Public Water System - A system providing piped water for public consumption. Such a system has at least fifteen service connections or regularly serves at least twenty-five individuals.

Rearing Habitat - Areas in rivers or streams where juvenile salmon and trout find food and shelter to live and grow.

Recovery Plan - A plan for the conservation and survival of an endangered species or a threatened species listed under the Endangered Species Act, to improve the status of the species to make continued listing unnecessary.

Recreational River - See Wild and Scenic River System.

Reforestation - Reestablishment of a tree crop on forest land.

Regeneration Harvest - Timber harvest conducted with the partial objective of opening a forest stand to the point where favored tree species will be reestablished.

Regeneration Period - The time it takes to reforest an area to adequate stocking following a timber sale.

Regulated Forest - A forest which comprises an even distribution of age classes or tree sizes, when the growth equals the cut (at the highest level sustainable) and when the level of growing stock remains relatively constant.

Representative Timber Management Scenario - A set of assumed timber harvest units, road locations and average annual levels of associated practices and intensive management practices for the decade of the expected life of the plan.

Research Natural Area (RNA) - An area that contains natural resource values of scientific interest and is managed primarily for research and educational purposes.

Reserved Federal Mineral Estate - Land on which the federal government has ownership of minerals but the surface estate is private or other nonfederal ownership.

Resource Management Plan (RMP) - A land use plan prepared by the BLM under current regulations in accordance with the Federal Land Policy and Management Act.

Respending Effects - The jobs and income generated by the purchase of goods and services by businesses or employees in the sector (s) being examined. Example: Purchases of legal services by wood products companies and their employees is a respending effect that creates jobs and income for lawyers.

Restoration and Retention Blocks - Ecological reserves managed to restore or retain old growth communities and respective plant communities.

Right-of-Way - A permit or an easement that authorizes the use of public lands for specified purposes, such as pipelines, roads, telephone lines, electric lines, reservoirs, and the lands covered by such an easement or permit.

Riparian Management Area - An area allocated in the plan primarily to protect the riparian and/or streamside zone.

Riparian Zone - Those terrestrial areas where the vegetation complex and microclimate conditions are products of the combined presence and influence of perennial and/or intermittent water, associated high water tables and soils which exhibit some wetness characteristics. Normally used to refer to the zone within which plants grow rooted in the water table of these rivers, streams, lakes, ponds, reservoirs, springs, marshes, seeps, bogs and wet meadows.

Ripping - The process of breaking up or loosening compacted soil to assure better penetration of roots of young tree seedlings.

Rotation - The planned number of years between the regeneration of an even-aged forest stand and its final cutting.

Rural Interface Areas - Areas where BLM-administered lands are adjacent to or intermingled with privately owned lands zoned for 1 to 20-acre lots or that already have residential development.

Salable Minerals - High volume, low value mineral resources including common varieties of rock, clay, decorative stone, sand, and gravel.

Scarification - Mechanical removal of competing vegetation or interfering debris prior to planting.

Scenic Quality - The relative worth of a landscape from a visual perception point of view.

Scenic River - See Wild and Scenic River System.

Scribner Short Log - A log measurement rule constructed from diagrams which shows the number of 1-inch boards that can be drawn in a circle representing the small end of a 16-foot-long log, assumes a 1/4-inch saw kerf groove, makes a liberal allowance for slabs, and disregards log taper.

Sediment Yield - The quantity of soil, rock particles, organic matter or other debris transported through a cross-section of stream in a given period of time. Measured in dry weight or by volume. Consists of suspended sediment and bedload.

Seed Tree Cutting Method - An even-aged reproductive cutting method in which all mature timber from an area is harvested in one entry except for a small number of trees left as a seed source for the harvested area.

Seed Orchard - A plantation of clones or seedlings from selected trees; isolated to reduce pollination from outside sources, weeded of undesirables, and cultured for early and abundant production of seed.

Selection Cutting - A method of uneven-aged management involving the harvesting of single trees from stands (single-tree selection) or in groups (group selection) without harvesting the entire stand at any one time.

Sensitivity Analysis - A process of examining specific trade-offs which would result from making changes in single elements of a plan alternative.

Sensitivity Levels - Measures (e.g., high, medium, and low) of public concern for the maintenance of scenic quality.

Seral Stages - The series of relatively transitory plant communities which develop during ecological succession from bare ground to the climax stage. There are five stages:

> Early Seral Stage - The period from disturbance to crown closure of conifer stands managed under the current forest management regime. Grass, herbs, or brush are plentiful.
>
> Mid Seral Stage - The period in the life of a forest stand from crown closure to first merchantability. Usually ages 15 through 40. Due to stand density, brush, grass or herbs rapidly decrease in the stand. Hiding cover may be present.
>
> Late Seral Stage - The period in the life of a forest stand from first merchantability to culmination of mean annual increment. This is under a regime including commercial thinning, or to 100 years of age, depending on wildlife habitat needs. During this period, stand diversity is minimal, except that conifer mortality rates will be fairly rapid. Hiding and thermal cover may be present. Forage is minimal.
>
> Mature Seral Stage - The period in the life of a forest stand from culmination of mean annual increment to an old-growth stage or to 200 years. This is a time of gradually increasing stand diversity. Hiding cover, thermal cover, and some forage may be present.
>
> Old-Growth - This stage constitutes the potential plant community capable of existing on a site given the frequency of natural disturbance events. For forest communities, this stage exists from approximately age 200 until when stand replacement occurs and secondary succession begins again. Depending on fire frequency and intensity, old-growth forests may have different structures, species composition and age distributions. In forests with longer periods between natural disturbance, the forest structure will be more even-aged at late mature or early old growth stages.

Shelterwood Cutting - A regeneration method under an even-aged silvicultural system. A portion of the mature stand is retained as a source of seed and/or protection during the period of regeneration. The mature stand is removed in two or more cuttings.

Short-Term - The period of time during which the RMP will be implemented; assumed to be l0 years.

Silvicultural Prescription - A professional plan for controlling the establishment, composition, constitution and growth of forests.

Silvicultural System - A planned sequence of treatments over the entire life of a forest stand needed to meet management objectives.

Site Class - A measure of an area's relative capacity for producing timber or other vegetation.

Site Index - A measure of forest productivity expressed as the height of the tallest trees in a stand at an index age.

Site Preparation - Any action taken in conjunction with a reforestation effort (natural or artificial) to create an environment which is favorable for survival of suitable trees during the first growing season. This environment can be created by altering ground cover, soil or microsite conditions, using biological, mechanical, or manual clearing, prescribed burns, herbicides or a combination of methods.

Skid Trail - A pathway created by dragging logs to a landing (gathering point).

Skyline Yarding - A cable yarding system using one of the cables to support a carriage from which logs are suspended and then pulled to a landing.

Slash - The branches, bark, tops, cull logs, and broken or uprooted trees left on the ground after logging.

Slope Failure - See Mass Movement.

Smoke Management - Conducting a prescribed fire under suitable fuel moisture and meteorological conditions with firing techniques that keep smoke impact on the environment within designated limits.

Smoke Management Program - A program designed to ensure that smoke impacts on air quality from agricultural or forestry burning operations are minimized; that impacts do not exceed, or significantly contribute to, violations of air quality standards or visibility protection guidelines; and that necessary open burning can be accomplished to achieve land management goals.

Smoke Sensitive Area - An area identified by the Oregon Smoke Management Plan that may be negatively affected by smoke but is not classified as a designated area.

Snag - Any standing dead, partially-dead, or defective (cull) tree at least 10 inches in diameter at breast height (dbh) and at least 6 feet tall. A hard snag is composed primarily of sound wood, generally merchantable. A soft snag is composed primarily of wood in advanced stages of decay and deterioration, generally not merchantable.

Snag Dependent Species - Birds and animals dependent on snags for nesting, roosting, or foraging habitat.

Soil Compaction - An increase in bulk density (weight per unit volume) and a decrease in soil porosity resulting from applied loads, vibration, or pressure.

Soil Displacement - The removal and horizontal movement of soil from one place to another by mechanical forces such as a blade.

Soil Productivity - Capacity or suitability of a soil, for establishment and growth of a specified crop or plant species.

Soil Series - A group of soils developed from a particular type of parent material; having naturally developed horizons that, except for texture of the surface layer, are similar in differentiating characteristics and in arrangement of the profile.

Special Areas - Areas that may need special management, which may include management as an ACEC, RNA, ONA, environmental education area, or other special category.

Special Habitat Features - Habitats of special importance due to their uniqueness or high value.

Special Recreation Management Area (SRMA) - An area where a commitment has been to provide specific recreation activity and experience opportunities. These areas usually require a high level of recreation investment and/or management. They include recreation sites but recreation sites alone do not constitute SRMAs.

Special Status Species - Plant or animal species falling in any of the following categories (see separate glossary definitions for each):

- Threatened or Endangered Species
- Proposed Threatened or Endangered Species
- Candidate Species
- State Listed Species
- Bureau Sensitive Species
- Bureau Assessment Species

Species Diversity - The number, different kinds, and relative abundance of species.

Split Estate - An area of land where the surface is nonfederally owned and the subsurface mineral resources are federally owned or vice versa.

Spotted Owl Habitat Sites - Sites monitored by BLM for spotted owl occupancy during some or all of the years 1985 through 1988, in accordance with BLM's spotted owl monitoring guidelines. These sites are known to have been inhabited by spotted owls at some time in the last dozen years, but not necessarily during the 1985-1988 period.

Stand - A reasonably homogenous forest area that is easily identified from other areas by its age, composition, structure, site quality or geography.

Stand Density - An expression of the number and size of trees on a forest site. May be expressed in terms of numbers of trees per acre, basal area, stand density index, or relative density index.

Stand-replacement Wildfire - A wildfire that kills nearly 100 percent of the stand.

State Historic Preservation Officer (SHPO) - The state official authorized to act as a liaison to the Secretary of the Interior for purposes of implementing the National Historic Preservation Act of 1966.

State Implementation Plan (SIP) - A state document, required by the Clean Air Act. It describes a comprehensive plan of action for achieving specified air quality objectives and standards for a particular locality or region within a specified time.

State Listed Species - Plant or animal species listed by the State of Oregon as threatened or endangered pursuant to ORS 496.004, ORS 498.026, or ORS 564.040.

Statewide Comprehensive Outdoor Recreation Plan (SCORP) - A plan prepared by the state, which describes and analyzes the organization and function of the outdoor recreation system of the state. The plan provides an analysis of the roles and responsibilities of major outdoor recreation suppliers; an analysis of demand, supply and needs; issue discussions; an action program to address the issues; and a project selection process.

Stocked/Stocking - Related to the number and spacing of trees in a forest stand.

Strategic and Critical Minerals - Minerals which supply military, industrial and essential civilian needs of the United States during a national defense emergency. They are not found or produced in this country in sufficient quantities to meet such needs. Nickel, cobalt and chromium are examples of such minerals occurring in western Oregon.

Stream Class - A system of stream classification established in the Oregon Forest Practices Act. Class I streams are those which are significant for: 1) domestic use, 2) angling, 3) water dependent recreation, and 4) spawning, rearing or migration of anadromous or game fish. All other streams are Class II. Class II special protection streams (Class II SP) are Class II streams which have a significant summertime cooling influence on downstream Class I waters which are at or near a temperature at which production of anadromous or game fish is limited.

Stream Order - A hydrologic system of stream classification. Each small unbranched tributary is a first order stream. Two first order streams join to make a second order stream. A third order stream has only first and second order tributaries, and so forth.

Stream Reach - An individual first order stream or a segment of another stream that has beginning and ending points at a stream confluence. Reach end points are normally designated where a tributary confluence changes the channel character or order. Although reaches identified by BLM are variable in length, they normally have a range of 1/2 to 1-1/2 miles in length unless channel character, confluence distribution, or management considerations require variance.

Structural Diversity - Variety in a forest stand that results from layering or tiering of the canopy and the die-back, death and ultimate decay of trees. In aquatic habitats, the presence of a variety of structural features such as logs and boulders that create a variety of habitat.

Succession - A series of dynamic changes following disturbance by which one group of plants succeeds another through stages leading to the potential natural community or to climax. The developmental series of plant communities is called a sere and defined stages are called seral stages.

Suitable Commercial Forest Land - Commercial forest land capable of sustained long-term timber production.

Suitable River - A river segment found, through administrative study by an appropriate agency, to meet the criteria for designation as a component of the National Wild and Scenic Rivers system, specified in Section 4(a) of the Wild and Scenic Rivers Act,

Suitable Woodland - Forest land occupied by minor conifer and hardwood species not considered in the commercial forest land ASQ determination and referred to as noncommercial species. These species may be considered commercial for fuelwood, etc. under woodland management. Also included are low site and nonsuitable commercial forest land. These lands must be biologically and environmentally capable of supporting a sustained yield of forest products.

Surface Erosion - The detachment and transport of soil particles by wind, water, or gravity. Surface erosion can occur as the loss of soil in a uniform layer (sheet erosion), in many rills, or by dry ravel.

Suspended Sediment - Sediment suspended in a fluid by the upward components of turbulent currents or by colloidal suspension.

Sustained Yield - The yield that a forest can produce continuously at a given intensity of management.

Sustained Yield Unit (SYU) - An administrative division for which an allowable sale quantity is calculated.

Target Stocking - The desirable number of well-spaced trees per acre at age of first commercial thinning.

Ten Percent Stocked - Stocking of tree seedlings and saplings (0.5 inches in diameter 4.5 feet above the ground) that are well distributed over the land and are more than 30 per acre in number. Or the stocking of trees larger than 5 inches in diameter with foliage that covers at least l0 percent of the land surface area.

Texture (soil) - The relative proportion of sand, silt, and clay in a soil; grouped into standard classes and subclasses in the USDA Soil Survey Manual.

Thermal Cover - Cover used by animals to lessen the effects of weather. For elk, a stand of conifer trees which are 40 feet or more tall with an average crown closure of 70 percent or more. For deer, cover may include saplings, shrubs or trees at least 5 feet tall with 75 percent crown closure.

Threatened Species - Any species defined through the Endangered Species Act as likely to become endangered within the foreseeable future throughout all or a significant portion of its range and published in the Federal Register.

Timber Management Plan - An activity plan that specifically addresses procedures related to the offering and sale of timber volume consistent with the approved allowable sale quantity.

Timber Production Capability Classification (TPCC) - The process of partitioning forestland into major classes indicating relative suitability to produce timber on a sustained yield basis.

Total Suspended Particulates - All solid or semi-solid material found in the atmosphere.

Transportation System - Network of roads used to manage BLM-administered lands. Includes BLM controlled roads and some privately controlled roads. Does not include Oregon Department of Transportation, county and municipal roads.

Travel Corridor - A route used by animals along a belt or band of suitable cover or habitat.

Understocked - The condition when a plantation of trees fails to meet the minimum requirements for number of well spaced trees per acre.

Uneven-aged Management - A single tree or group selection harvest method that creates and/or maintains a forest with a wide range of age and diameter classes and a continuous forest canopy.

Unique Ecosystems - Ecosystems embracing special habitat features such as beaches and dunes, talus slopes, meadows, and wetlands.

Unnecessary or Undue Degradation - Surface disturbance greater than what would normally result when a mineral exploration or development activity regulated under 43 CFR 3809 is being accomplished by a prudent operator in usual, customary and proficient operations of similar character and taking into consideration the effects of operations on other resources and land uses, outside the area of operations. Failure to initiate and complete reasonable mitigation measures, including reclamation of disturbed areas; or failure to prevent the creation of a nuisance, which may constitute unnecessary or undue degradation. Failure to comply with applicable environmental protection statutes and regulations thereunder will constitute unnecessary or undue degradation.

Utility Corridor - A linear strip of land identified for the present or future location of utility lines within its boundaries.

Viable Population - A wildlife or plant population of sufficient size to maintain its existence in spite of normal fluctuations in population levels.

Viewshed - The landscape that can be directly seen from a viewpoint or along a transportation corridor.

Visibility Protection Plan - A plan that implements the requirements of the Clean Air Act by establishing programs for visibility monitoring; short and long term control strategies; and procedures for program review, coordination, and consultation.

Visual Resources - The visible physical features of a landscape.

Visual Resource Management (VRM) - The inventory and planning actions to identify visual values and establish objectives for managing those values and the management actions to achieve visual management objectives.

Visual Resource Management Classes - Categories assigned to public lands based on scenic quality, sensitivity level, and distance zones. There are four classes. Each class has an objective that prescribes the amount of modification allowed in the landscape.

Water Quality - The chemical, physical, and biological characteristics of water.

Water Yield - The quantity of water derived from a unit area of watershed.

Western Oregon Digital Data Base (WODDB) - A very high resolution (1"=400') geographic digital (computer) data base derived from aerial photography for BLM lands in western Oregon.

Wetlands or Wetland Habitat - Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for live in saturated soil conditions. Wetlands generally include, but are not limited to, swamps, marshes, bogs, and similar areas.

Wet Meadows - Areas where grasses predominate. Normally waterlogged within a few inches of the ground surface.

Wild and Scenic River System - A national system of rivers or river segments that have been designated by Congress and the President as part of the National Wild and Scenic Rivers System (Public Law 90-542, 1968). Each designated river is classified as one of the following:

Wild River - A river or section of a river free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. Designated wild as part of the National Wild and Scenic Rivers System.

Scenic River - A river or section of a river free of impoundments, with shorelines or watersheds still largely primitive and undeveloped but accessible in places by roads. Designated scenic as part of the National Wild and Scenic Rivers System.

Recreational River - A river or section of a river readily accessible by road or railroad, that may have some development along its shorelines, and that may have undergone some impoundment of diversion in the past. Designated recreational as part of the National Wild and Scenic Rivers System.

Wilderness Study Area (WSA) - A roadless area inventoried and found to be wilderness in character, having few human developments and providing outstanding opportunities for solitude and primitive recreation, as described in Section 603 of the Federal Land Policy and Management Act and in Section 2(c) of the Wilderness Act of l964.

Wildlife Tree - A live tree retained to become future snag habitat.

Wild River - See Wild and Scenic River System

Windthrow - A tree or trees uprooted or felled by the wind.

Withdrawal - A designation which restricts or closes public lands from the operation of land or mineral disposal laws.

Woodland - Forest land producing trees not typically used as saw timber products and not included in calculation of the commercial forest land ASQ.

Yarding - The act or process of moving logs to a landing.

Yield Table - A table of timber volumes expected to be produced under a certain set of conditions.

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Index

Access 2-10, 2-17
Air quality 2-4, 2-18, 3-4, 3-9, 4-6, 4-7
Anadromous fish 2-18, 3-80, 4-14
Analytical watershed 2-5, 3-12, 3-21, 3-22, 4-13, 4-14
Area of Critical Environmental Concern (ACEC) 2-3, 2-16, 2-22, 2-24, 2-29, 2-33, 2-34, 2-38, 2-39, 2-41, 2-48, 2-52, 2-55, 3-28., 2-53, 3-56, 4-73

Back County Byway 2-12, 2-38, 2-44
Best management practices (BMPs) 2-4, 2-5, 2-48
Biological Diversity 2-2, 2-27, 2-28, 3-47, 4-17

Commercial forest land 2-6, 3-80, 4-19, 4-82
Communication site 2-16, 3-4
Community stability 2-2, 2-3, 2-4, 3-77, 3-81, 4-94
Critical habitat 4-61
Corridor (right-of-way) 2-16, 3-3
Cultural resources 2-2, 2-13, 2-15, 3-57, 4-75
Cumulative effects 2-5, 4-2, 4-6, 4-12, 4-44, 4-47, 4-51, 4-53, 4-54, 4-55, 4-56, 4-60, 4-71, 4-86

Employment 3-75, 3-76, 3-80, 3-81, 4-92
Endangered species (see Threatened and endangered species)
Energy use 1-8, 2-16, 2-17, 2-20, 2-58, 2-65, 3-3, 4-89, 4-91

Firewood 2-9, 4-7
Fire management 2-4, 2-5, 2-18, 2-19, 2-27, 2-42, 3-4, 3-9, 4-6
Fish 2-5, 2-11, 2-54, 2-60, 3-38, 3-80, 4-55, 4-57
Flood plains 2-5
Forage 2-11, 4-5, 4-47

Genetically selected stock 2-8, 2-22, 2-53, 4-85
Groundwater 3-12, 4-13

Habitat diversity 2-11, 2-22, 2-24, 2-28, 2-32, 2-37, 2-41, 2-43, 3-34, 4-44
Hazardous materials2-18
Herbicides 1-8, 2-7, 2-8, 2-9, 2-22, 2-24, 2-27, 2-28, 2-32, 2-36, 2-42, 2-43, 4-41
Hydropower 1-8, 2-16, 2-17

Irreversible or irretrievable commitment of resources 4-2

Jobs (also see Employment) 4-92

Land exchanges 1-7, 2-2, 2-3, 2-14, 2-15, 2-20, 2-22, 2-25, 2-30, 2-34, 2-40, 2-45, 2-50, 2-58, 3-3
Leasable minerals 2-17, 2-30, 2-35, 2-40, 4-89
Livestock (grazing) 4-41
Locatable minerals 2-17, 2-20, 2-23, 2-25, 2-45, 2-65, 3-75, 4-89

Mineral exploration (and development) 1-8, 2-17, 2-75, 4-89
Mineral leases (leasing) (see Leasable minerals)
Mining 2-18, 2-20, 2-25, 2-30, 2-35, 2-46, 2-58, 2-65, 3-75, 4-42, 4-89
Mining location (see Locatable minerals)
Mitigation 2-2, 4-3
Monitoring 1-6, 2-10, 2-47, 2-50

Native American 2-14
Noxious plant/weed 1-2, 2-18, 3-28, 3-30, 4-41

Old growth 1-7, 2-2, 2-3, 2-20, 2-21, 2-23, 2-25, 2-27, 2-28, 2-31, 2-35, 2-36, 2-41, 2-52, 3-33, 3-46, 3-53, 4-17, 4-114
Outstanding Natural Area 4-73

Pacific yew 2-4, 4-41
Planning criteria 1-6,
Prime and unique farm lands, 4-41

Range management (see Livestock grazing) 1-7,
Recovery plan 2-10, 2-28, 2-32, 2-37, 3-47, 4-61, 4-64
Reforest(ation) 2-8, 2-27, 4-17, 4-85
Research Natural Area 2-12, 2-22, 2-24, 2-29, 2-33, 2-38, 3-28, 3-53, 3-56, 4-73
Rights-of-way 2-10, 2-16, 2-58, 3-4, 4-44
Riparian zone 1-7, 2-4, 2-5, 2-20, 2-21, 2-23, 2-25, 2-26, 2-31, 2-36, 2-40, 2-51, 2-55, 3-30, 4-41, 4-45
Road(s) 2-5, 2-6, 2-10, 2-11, 2-18, 2-24, 2-27, 2-29, 2-43, 2-49, 2-53, 3-4, 4-44, 4-84
Rural interface areas 1-7, 2-2, 2-3, 2-23, 2-25, 2-30, 32,35, 2-40, 2-46, 2-59, 3-83, 3-86, 4-100

Scenic resources 2-13, 2-20, 2-22, 2-25, 2-30, 2-39, 2-45, 3-58, 4-75
Sensitive species 2-22, 2-24, 2-42, 3-39, 4-52, 4-58, 4-60
Sensitivity analysis 2-3, 4-69
Smoke management 2-4, 2-7, 2-18, 3-4, 4-6
Soil(s) 2-4, 2-5, 2-7, 3-9, 4-7
Spotted owl 2-3, 2-31, 2-36, 2-43, 3-46, 4-61, 4-63
State-listed species 2-24, 2-28 2-42, 4-52

Threatened and endangered species 1-7, 2-2, 2-3, 2-10, 2-20, 2-22, 2-42, 2-54, 3-31, 3-39, 4-52
Timber production capability classification (TPCC) 2-5, 2-21, 2-23, 2-26, 2-31, 2-36, 2-41, 2-48, 3-11, 3-66, 3-70, 3-71, 4-9, 4-82

Unique ecosystem 4-23, 4-46

Vegetation 3,26, 4-32, 4-41
Visual resources 1-7. 2-13, 2-16, 2-20, 2-22, 2-25, 2-30, 2-34, 2-35, 2-39, 2-45, 2-46, 2-56, 2-57, 2-59, 3-58, 4-75

Water quality 2-4, 2-5, 2-6, 2-20, 2-21, 2-23, 2-25, 2-31, 2-35, 2-40, 2-48, 2-49, 2-51, 3-12, 3-21, 4-12, 4-16, 4-54
Water yield 3-15, 4-13
Wetland(s) 2-5, 2-22, 2-24, 2-29, 3-28, 4-41
Wild and scenic river(s) 1-2, 1-7, 2-2, 2-3, 2-5, 2-12, 2-13, 2-20, 2-22, 2-25, 2-26, 2-30, 2-34, 2-39, 2-45, 3-58, 3-59, 4-77

Yew (see Pacific yew)

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